The Corps

of

Royal Canadian Electrical and Mechanical Engineers

RCEME Trades 1944-2020

A Reference Guide

Trade Specifications

Volume 12 - Vehicle Mechanic / Technician Trades

The RCEME Heritage Archives

RCEME Trades 1944-2020

A Reference Guide

Trade Specifications

Volume 12 - Vehicle Mechanic / Technician Trades

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Introduction

RCEME Trades 1944-2020, A Reference Guide summarizes the trades that were part of RCEME when the Corps was formed in 1944, and follows the development, amalgamations, changes, and history from that time to the four trades that are part of RCEME today. During the research for that document, many trades specifications and standards were found in the Library and Archives Canada (LAC) and other repositories. These were used to prepare a thumbnail history of each trade in the main reference, but space precluded the inclusion of the complete trade specification and/or standard.

This "Trades Specifications" series supports the main document and includes the original trade specifications and references as they were found at the LAC and elsewhere. This is a source document for researchers. In general, the raw photographs of the LAC file pages have been converted to a searchable .pdf file. No attempt has been made to reformat the contents of the original files.

Guide to the Series

Because of the size of some of the files, the trades have been separated into several volumes, each containing the specifications for a group of trades. The series consists of:

Volume 1 - Aircraft Trades

Volume 2 - Armourer, Armament, and Weapons Technician Trades

Volume 3 - Body and Tire Repair Trades

Volume 4 - Driver and Driver Mechanic Trades

Volume 5 - Electrical Trades

Volume 6 - Instructor Trades

Volume 7 - Instrument Trades

Volume 8 - Metals, Machinist, and Welding Trades

Volume 9 - Radar and Fire Control System (1950s) Trades

Volume 10 - Radio and Telecommunication Trades

Volume 11 - Recovery Mechanic Trades

Volume 12 - Vehicle Repair Trades

Volume 13 - Other Trades

Volume 14 - Trade Reviews

Volume 15 - Post-Unification Trades

Volume 16 - RCEME Trades in 2020

Source Documents

This is a supporting reference for *RCEME Trades 1944-2020, A Reference Guide*. The list of sources for the main document is reproduced below. Where possible, the source document (or a relevant excerpt) has been scanned and placed on the RCEME Historical Database. Sometimes, a copy may be on the Internet Archive. One location of the primary document is included - there may be other copies in existence.

Primary sources include:

Instructions Regarding Trades Tests and Tradesmen's Rates of Pay, Canadian Army (Overseas), 1943. A copy is available in the Canadian War Museum under the call reference UB 337 I57 CWM Ref Tech 1943. Short reference in this document: [Trades 1943]. This document does not relate trades to a specific Corps. The relationship to RCOC(E) and later RCEME is inferred.

Instructions Regarding Trades Tests and Trades Testing, Canadian Army, 1944. Queens Printer, 1944. A copy is available in the Canadian War Museum under the call reference UB 337 C2 I5 CWM Ref Tech 1944. Short reference in this document: [Trades 1944]. This reference had two major amendments: AL 1 dated 1 January 1945, and AL 2 (not dated), both included in the reference. This reference relates to the Canadian Army as a whole, and not just the Canadian Army Overseas. The assignment of trades to Corps includes RCEME, which is evidence that it was updated after the formation of CEME/RCEME.

Canadian Army Routine Order (CARO) No. 4230 dated 15 March 1944. The Annexes to this CARO (and subsequent CAROs that amended CARO 4230) detailed the units and trades that were to be transferred to the new Corps of RCEME. The Canadian War Museum has a set of CARO.

Canadian Army Routine Order No. 6579 dated 20 May 1946. This was the first major postwar regrouping of Army trades and classification of tradesmen. A copy is available in the Canadian War Museum under the call reference Ref Tech Folio UB 505 C2 A7. Short reference in this document: [CARO 6579 (1946)].

Canadian Army Order No. 269-1 dated 8 April 1947. This order amplified and clarified[CARO 6579 (1946)] and is part of the new Canadian Army Orders series that replaced the Canadian Army Routine Orders in 1947. A copy is available in the Canadian War Museum under the call reference Ref Tech UB 507 A6 S8. It also announced that a new publication "Canadian Army Trades Tests 1946" would be issued, (which has not been found). Short reference in this document: [CAO 269-1 (1947)].

Canadian Army Order No. 269-1 dated 22 August 1949. Trades Designations, Groupings of Trades, Responsibility for Training and Corps Affiliation. This replaced and updated [CAO 269-1 (1947)]. It also assigned trades to specific Corps. A copy is available in the Canadian War Museum under the call reference Ref Tech UB 507 A6 S8. Short reference in this document: [CAO 269-1 (1949)]. This reference was amended in CAO 269-1 dated 6 February 1950, which is included as part of this source.

Canadian Army Order No. 269-1 dated 27 November 1950. Trades Designations, Groupings of Trades, Responsibility for Training and Corps Affiliation. This replaced and updated [CAO 269-1 (1949)]. A copy is available in the Canadian War

Museum under the call reference Ref Tech UB 507 A6 S8. Short reference in this document: [CAO 269-1 (1950)].

Canadian Army Order No. 269-1 dated 5 May 1952. Trades Designations, Groupings of Trades, Responsibility for Training and Corps Affiliation. This replaced and updated [CAO 269-1 (1950)]. A copy is available in the Canadian War Museum under the call reference Ref Tech UB 507 A6 S8. Short reference in this document: [CAO 269-1 (1952)].

There would appear to have been an update to CAO 269-1 in 1954, but the CWM does not have a copy of that CAO - DHH might.

Canadian Army Manual of Trades and Specialties. This detailed the Canadian Army trade standards and specifications and replaced the Canadian Army Trades Tests series. The manual seems to have come into effect by CAO 225-52 dated 18 November 1957. There is apparently no CAO 269-1 after that date. The RCEME trades extracted from this document are dated in the late 1950s and early 1960s. A copy is available in the Canadian War Museum under the call reference Ref Tech UB 337 C2 C3 n.d. This reference is not complete. A complete version may exist at DHH (apparently not). Short reference in this document: [CAMTS].

Files in the Library and Archives, Canada (LAC). There are files in the LAC on many of the RCEME trades in the 1950s and early 1960s. These files have been reviewed and the specific file reference is contained in Annex A for the specific trade in question. See also the Army Trades Committee paragraph below. Short reference in this document: [LAC - file reference].

A specific file at the LAC is RG24-C-1-a, Volume 2165, File HQS-54-27-35-320, Trades Training & Tests - RCEME - Policy 1944-1947. It is not complete, but provides documentary evidence of the DEME position on the creation and elimination of some trades. Where other official confirmation has not been found (e.g. in the Army Trades Committee files), this file has been accepted as an authority. Short reference in this document: [LAC - Policy - Training of Tradesmen, RCEME]

Army Trades Committee and Army Trades Committee Sub-committee files at the LAC. A specific series of files at the LAC are the minutes of the Army Trades Committee and Army Trades Committee Sub-committee from about 1950 to 1965. They are best located by using the LAC search engine. The minutes give the approval (and date) for trade actions, and are often accompanied by supporting documentation such as trades specifications. Short reference in this document: [LAC - ATC and LAC - ATCSC]. The Directorate of History and Heritage also has a copy of some of these files. Between DHH and the LAC, there should be a complete set.

Files in the RCEME Archives. The RCEME archives, currently located at the RCEME School, have a few trades files. Most date from the early 1960s. There is a separate list ing of all the files in the RCEME archives. Short reference in this document: [RCEME Archives].

Bennett, Thomas J. **Skill at Arms, A History of Canadian Army Trades including their Badges and Parachute Wings**. Bunker to Bunker Books, Calgary, AB, 2005. The book appears to be out of print. A copy is in the Canadian War Museum Library under the call number UC 535 C3 B458 2005. Short reference in this document: [Skill at Arms]. It is an outstanding reference work, and was used heavily in the creation of the first draft of this document. However, unfortunately it does not link to primary

sources, and has been replaced as a source document as primary sources become available. That said, few discrepancies have been found, and I have full confidence in this book as a source. It was my primary reference for relating the badges worn by the trades.

RCEME Historical Database. Documents of general and specific interest to RCEME have been placed on a Google drive, part of which is shared with the public. All files in the public section of the database can be downloaded. The database can be accessed through the history and heritage tab on the Corps of RCEME website. Supporting documentation is in the RCEME Complete Digital Archives on the same Google Drive. The supporting documentation (such as the raw document scans) is not available to the general public, but can be requested from the RCEME Historian if required. Short reference in this document: [RCEME Historical Database].

RCEME Trades Source Documents at the LAC (Postwar and Pre-Unification)

The following Policy of Training and Qualifications files have been located at the LAC. All files have been reviewed and relevant details, including trades specifications, have been photographed and a pdf file of the information has been created and placed on the RCEME Historical Database. In general, the information contained in the files is limited to a copy of the draft trades standard. It is a disappointing source, but provides an index to the trades that were in existence.

Policy of Training and Qualifications - Artificers 1951-1961. [LAC Reference: RG24-C-1-c, Volume/box number 31348, File number 3202-A15.]

Policy of Training and Qualifications - Body Repairman 1952-1959. [LAC Reference: RG24-C-1-c, Volume/box number 31348, File number 3202-B22.]

Policy of Training and Qualifications - Driver Mechanics (Wheeled) 1956-1958. [LAC Reference: RG24-C-1-c, Volume/box number 31349, File number 3202-D22/2.]

Policy of Training and Qualifications - Driver Mechanics (Tracked) 1950-1956. [LAC Reference: RG24-C-1-c, Volume/box number 31349, File number 3202-D22/1.]

Policy of Training and Qualifications - Electrical Mechanic 1955-1960. [LAC Reference: RG24-C-1-c, Volume/box number 31362, File number 3202-E14.]

Policy of Training and Qualifications - Fire Control System Technician (AA) 1955-1959. [LAC Reference: RG24-C-1-c, Volume/box number 31362, File number 3202-F9.]

Policy of Training and Qualifications - Fitters 1949-1950. [LAC Reference: RG24-C-1-c, Volume/box number 31362, File number 3202-F18.]

Policy of Training and Qualifications - Instructors (RCEME) 1950-1955. [LAC Reference: RG24-C-1-c, Volume/box number 31363, File number 3202-J2/7.]

Policy of Training and Qualifications - Instrument Technician 1950-1959. [LAC Reference: RG24-C-1-c, Volume/box number 31362, File number 3202-J11.]

Policy of Training and Qualifications - Machinist Fitter 1951-1962. [LAC Reference: RG24-C-1-c, Volume/box number 31363, File number 3202-M2/1.]

Policy of Training and Qualifications - Machinist (Metal) 1946-1965. [LAC Reference: RG24-E-1-c, Volume/box number 32842, File number 450-M1. RCAF file.]

Policy of Training and Qualifications - Master Vehicle Technicians 1954-1958. [LAC Reference: RG24-C-1-c, Volume/box number 31369, File number 3202-V8/M.]

Policy of Training and Qualifications - Master Weapons Technician 1955-1958. [LAC Reference: RG24-C-1-c, Volume/box number 31369, File number 3202-W8/M.]

Policy of Training and Qualifications - Projectionist Clerk. [LAC Reference: RG24-C-1-c, Volume/box number 31368, File number 3202-P49.]

Policy of Training and Qualifications - Radar Technician 1951-1954. [LAC Reference: RG24-C-1-c, Volume/box number 31368, File number 3202-R3.]

Policy of Training and Qualifications - Radio Technician 1955-1960. [LAC Reference: RG24-C-1-c, Volume/box number 31368, File number 3202-R12.]

Policy of Training and Qualifications - Recovery Mechanic 1953-1954. [LAC Reference: RG24-C-1-c, Volume/box number 31368, File number 3202-R11.]

Policy of Training and Qualifications - Tire Repairman 1952-1954. [LAC Reference: RG24-C-1-c, Volume/box number 31369, File number 3202-T18.]

Policy of Training and Qualifications - Typewriter Mechanics 1952-1956. [LAC Reference: RG24-C-1-c, Volume/box number 31369, File number 3202-T30.]

Policy of Training and Qualifications - Vehicle Mechanics 1950-1961. [LAC Reference: RG24-C-1-c, Volume/box number 31369, File number 3202-V6.]

Policy of Training and Qualifications - Vehicle Mechanics 1961-1963. [LAC Reference: RG24-C-1-c, Volume/box number 31369, File number 3202-V6.]

Policy of Training and Qualifications - Watchmaker 1952-1956. [LAC Reference: RG24-C-1-c, Volume/box number 31369, File number 3202-W4.]

Policy of Training and Qualifications - Weapons Technician 1954-1958. [LAC Reference: RG24-C-1-c, Volume/box number 31369, File number 3202-W8.]

Policy of Training and Qualifications - Welders 1952-1956. [LAC Reference: RG24-C-1-c, Volume/box number 31369, File number 3202-W6.]

Vehicle Artificer Group 4, 1954

FILE NUMBER 3202-V8/M VOL.

DEPARTMENT OF NATIONAL DEFENCE

POLICY OF TRAINING & QUALIFICATION MASTER VEHICLE TECHNICIANS

FOR CROSS REFERENCES SEE INSIDE COVER

ROUTING				P.A. AND B.F. ENTRIES				REGISTRY ONLY	
REFERRED	REMARKS	Date of Pass	Initials	Date of P.A.	Initials	Date of B.F.	Cancel B.F.	Date Received	Inspected by

FILE NUMBER 3202-V8/M VOL.

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C 18

IN REPLY PLEASE QUOTE
NO. RS 3667-1(CI)

CANADA

Department of National Defence

THE RCEME SCHOOL

KINGSTON, 24 Jun 54.

Referred to D.E.M.E
JUN 28 1954
File No 3202-V2
Chgd to

Army Headquarters,
Dept of Nat Defence,
OTTAWA, Ontario.

Attn: ADEME(P & T)

Training Standard

1 Herewith for your retention are six copies of the proposed training standard for Vehicle Artificers Group 4.

4 copies retained by ADEME - P&T 28/6/54

Enc

HKW/5501 L 7

for (C W Jones), Colonel,
Commandant,
The RCEME School.

C.A.F.A. 23
1 MIL.—5-51 (4815)
H.Q. 224-21-A-23

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE ARTIFICER GROUP 4

AIM

1. To qualify candidates as Vehicle Artificers Group 4

APPLICATION

2. The lessons that should be covered and the reference texts of which a knowledge is required in order to reach each standard are set out opposite the standard concerned.

3. The number of lessons thus indicated bears no relation to the number of periods which may be required to teach the lessons.

4. The decision as to the number of periods necessary in any subject will be made by the officer directly concerned with the training in that subject.

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE ARTIFICER GROUP 4

INDEX

SERIAL	SUBJECT
1	Technical Administrations
2	Bench Fitting and Shop Practice
3	Repair
4	Overhaul & Rebuild of Vehicle Components
5	Performance Analysis
6	Servicing
7	Recovery

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE ARTIFICER GROUP 4

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
1	Technical Administrations	Must be capable of: Writing technical reports and instructions including inspection summaries and allottment of unit maintenance grading, equipment failure reports and provisional condemnation certificates, and modification recommendations	CAEMEIs Veh A104 Instr 6
		Must be capable of: Preparing accurate dimensional working sketches and automotive electrical wiring diagrams in accordance with job and shop requirements	Bluepring Reading for Beginners - Delmar (Entire) TM10-580 Para 82
		Must be capable of: Recommending whether equipment should be repaired, backloaded or provisionally condemned by considering the scope and type of repairs, availability of parts and labour, repair facilities and costs.	RCEME Corps Instruction Veh No 4
		Must be capable of: Preparing spare parts scale of issue as to number, and life expectancy of vehicle and special equipment components	Cdn Army EME Manual - Static Operations S011-Spare Parts Usage Returns. CAEMEIs Scales K040 - RCEME Scales Organization
2	Bench Fitting and Shop Practice	Must know: The fundamentals and recognize the limitations, of oxy-acetylene and electric arc-welding in order to operate the equipments safely and carry out simple welding, brazing and cutting operations.	Oxy-Acet. Handbook - Lind Air Co. Pgs. 15-141, 170-210, 246-253, 386-390, 411-444, 503-522 New lessons in Arc-Welding P 1-57 RCEME School Precis No 2-1-1 Para 10

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE ARTIFICER GROUP 4

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
2	Bench Fitting and Shop Practice	Must Know: The construction, operation of, and types of work that may be performed on lathes, milling machines, shapers grinders and contour saws in order to carry out simple machining operations.	Machine Shop Theory and Practice - Wagener & Arthur Pgs 36-42, 44-56, 67-72, 85-107, 122-152, 155-165, 185, 201-202, 224, 231, 240-243 Lathe Work - Delmar Pgs 10-16, 19-28, 31-34, 51-55, 68-74, 80-83, 89-95, 116-152, 161-164. Milling Machine Work - Delmar Pgs 1-100, 121-153, 220-298 Shaper Work - Delmar Pgs 3-32, 97-150, 189-219, 293-303, 322-326 Machine Tool Operation - Burghart - Pgs 329-388 RCEME School Precis No 2-1-1 Sec 5 Films OE-6,8,9,10,42&43.
		Must know: The essentials of metallurgy and the classification, structure, features, uses and identification of metals, methods of heat treatment and general blacksmithing applicable to the automotive trade.	RCEME School Precis No 4-1-2 Visualized Chemistry - Lemkin, Chaps 20,21 & 22 Elementary Forge Practice - Harcourt Pgs 12-19, 101-109, 156-160, 164-167 Forging Iron & Steel - Richards, Pgs 34-39, 58-67
3	Repairs	Must know: The Corps of Royal Canadian Electrical and Mechanical Engineers repair policy.	RCEME Corp Instruction Wksp No 16 Wksp/Gen No 101-103 Wksp/Prod No 201-214

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE ARTIFICER GROUP 4

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
3	Repairs	Must know: The methods, equipments and procedures of vehicle frame straightening in order to carry out and/or supervise frame alignment projects.	TM10-450 Para 23 Frame Straightening - Bear Service Pg 1-32
		Must have a general knowledge of: Special tools and equipments applicable to repairs in the automotive trade, in order to supervise their care and proper use.	Service & Instruction Manuals - Applicable to equipments in use
		Must have a general knowledge of: The procedures and methods of body repairs in order to form accurate estimates of damage, including scope and type of repairs, availability of parts and labour, repair facilities and costs.	TM10-450, Secs 1-5
		Must know: The methods and procedures in vehicle painting and undercoating in order to supervise all operations within scope of the paint shop.	TM10-455 Sec 4 CAEMEIs Vehicles A 283 Instruction 1 RCEME Corps Instructions Wksp No 44
		Must have a general knowledge of: Other trades in the Corps of Royal Canadian Electrical and Mechanical Engineers in order to appreciate their scope and role.	Specifications for Army Trades & Specialities (All RCEME Trades) Para 3

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE ARTIFICER GROUP 4

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
4	Overhaul and Rebuild of Vehicle Components	Must be capable of: Testing, adjusting and operating precision equipment used in engine and component rebuilding.	TM9-1834A Secs 2,3,8,9,11, 12,14 RCEME School Precis No 6-4-1
		Must be able to: Overhaul engines and vehicle components, and carry out precision inspection of parts taken from used assemblies to ascertain their serviceability	Maint. Manuals applicable to equipments CAEMEIs Vehicle - X314/1 Instr 1 X504/1 Instr 1. X504/2Instr 1, X704/1 Instr 1, X704/2 Instr 1 X744/1 Instr 1, X004 Instrs 2,3&4, X094 Instr 1, X114/1 Instr 1, X114/2 Instr 1, X229 Instrs 1,2&3, X229/1 Instr 1, X264 Instr 1
		Must be capable of: Overhauling diesel fuel injection equipment employing the correct use of all test equipment in order to supervise Diesel equipment repair programes.	Maint. Manuals applicable to equipments TM9-2700 Chap 6 Secs 1-3. CAEMEIs Vehicles A542/1,A542/2, Operator's Manual - (A542_3 Hartridge Fuel pump test bench.
		Must be capable of: Overhauling all types of standard and automatic transmissions including power transfer units.	TM9-1819AB CAEMEIs Vehicles 0-013 Instr 3 Maint Manuals applicable to equipments in use
5	Performance Analysis	Must know: The basic design principles of wheeled and tracked vehicles in order to train junior tradesmen in the performance of their duties by direct supervision and conducting courses or periods of in-job training	TM9-2700 (with annexure CI) (Entire) Maintenance Manuals applicable to equipments in use

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE ARTIFICER GROUP 4

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
5	Performance Analysis	Must be able to: Carry out performance analysis or inspections on engines and special power and engineer equipment using dynamometers and special test equipment	TM9-2700 Chap 3 Sec 3 Wiedenhoff Engine Analyser Manual
		Must be capable of: Critical examination of work from civilian contractors and other workshop sections to determine completeness, quality and operating efficiency.	
		Must know: Gasoline and diesel fuel characteristics including distilation & cracking processes, additives, antiknock properties, octance & cetane ratings, pour points and flash points.	Visualized Chemistry - Lemki Chap 15 Audels new Automobile guide Chap 20 High Speed Diesel Engines - A W Judge Chap 20
		Must know: The theory of gasoline and diesel engines including cycles, efficiencies, horsepower ratings and special engineering design features.	TM9-2700 Chap 3, Secs 1,2&3 Chap 6 Secs 1,2 & 3 Audels New Automobile Guide Chaps 5,7,14 & 17
		Must know: The principles of compressed air and hydraulics in order to analyse the performance of air compressors and hydraulic power systems.	Elements of Physics - Merchant & Chant Chaps 5 & 13

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE ARTIFICERS GROUP 4

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
5	Performance Analysis	The principles and methods of power transmission	TM 9-2700 Chaps 13-17 incl Audels New Automobile Guide Chaps 26-31 incl
6	Servicing	Must have a general knowledge of: Vehicle and special equipment servicing for arctic, desert and amphibian operations.	CAEMEIs Veh Gen A 542 Instr 1-3 Gen A 453 Instr 1 TM 9-2835 Chap 10
		Must know: The characteristics, and be able to recognize all oils and lubricants for servicing and preservation of vehicles, components and special equipments.	CAO 214-1 Appx "A" CAEMEIs Veh A 354 Instr 1
		Must know: Active and Reserve Force maintenance, organization and responsibilities.	CAO 286-14
7	Recovery	Must know: Recovery team essentials, use of casualty cards, recovery rules and safety precautions, and enemy interference	RCEME School Precis No 6-26-1 Film C-789 Film C-605
		Must know: (a) The proper care and use of hemp rope including knotting and splicing.	TM5-225 Chap 2 RCEME School Precis No 6-26-3
		(b) The proper care and use of wire rope including selection, lays, grade and safe working loads splicing and the correct use of thimbles and clamps	RCEME School Precis No 6-26-2 TM 5-225 Chap 3, Secs 1-4

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE ARTIFICER GROUP 4

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
7	Recovery	Must be capable of: (a) Selecting suitable recovery equipments as to proper capacities, winches, boom, and necessary stowage.	Guide to Recover RCEME School Precis No 6-26-1 Paras 13-26
		(b) Forming simple and compound layouts of tackle, and removing light and heavy casualties from heavy bogged terrain	Guide to Recovery RCEME School Precis No 6-26-1 Paras 13-26
		Must know: Soil characteristics and the safe operation of recovery equipment over snow, ice, shale, rock, sand, mud and bog.	Manual of Recovery (c) Part 1
		Must be capable of: Planning and supervising recovery operations on vehicle and equipment casualties under all conditions	RCEME School Precis No 6-26-1 Para 1-12 Film C605 CAEMEI Gen G070
		Must know: Voice procedure and radio communication in the control and organization of recovery operation	CAEMEI - Tels I 160 and 161 Signal Training (All Arms) 1952 Pamphlet No 7 Secs 1-5, 6,8-14, 18-19 and Appx "B"

Vehicle Mechanic General Notes, 1954

DND 3045-1 (A)

FILE NUMBER 3202-V6 **VOL.** 1

DEPARTMENT OF NATIONAL DEFENCE

POLICY OF TRAINING &QUALIFICATIONS

VEHICLE MECHANICS

FOR CROSS REFERENCES SEE INSIDE COVER

ROUTING				P.A. AND B.F. ENTRIES				REGISTRY ONLY	
REFERRED	REMARKS	Date of Pass	Initials	Date of P.A.	Initials	Date of B.F.	Cancel B.F.	Date Received	Inspected by

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VOL. 1 FILE NUMBER 3202-V6

ARMY

3202-V6

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PA → 3202-V6

ARMY HEADQUARTERS

HQS 3667-2 (Trg 2)
HQ 3666-V6/2

OTTAWA, 16 Mar 50

DCGS

Centralization of Trades Training
Vehicle Mechanics Tracked and Wheeled

1 At the present time Vehicle Mechanics may belong to any one of several corps, and each corps is responsible for training its own personnel. This has many implications, the more important of which are the over training of tradesmen in certain corps, duplication of training facilities, and wastage of manpower. The preceding memorandum considers these implications in detail and recommends:

(a) That RCEME be made responsible for the trade of Vehicle Mechanic in all corps. Driver Mechanics would continue to be the responsibility of several corps.

(b) That the absorption of Vehicle Mechanics by RCEME be on a phased programme to be determined by DME. In this way disruption of repair services and unit maintenance would be avoided.

(c) That the trade of Vehicle Mechanic, Gp 1, be re-introduced. At the present time Vehicle Mechanics progress from the trade of Driver Mechanic, and as a result, all Driver Mechanics are over-trained in order to provide the background required for those who progress to Vehicle Mechanic, Gp 2.

(d) That the trade specification for Driver Mechanic be re-written, deleting all the repair aspects and the theoretical training required for upgrading to Vehicle Mechanic, Gp 2. When re-written, the specification should reflect the driving and maintenace aspects only.

(e) That RCEME assume the responsibility for training Vehicle Mechanics of all corps pending the absorption by RCEME of Vehicle Mechanics of other corps. This would obviate a considerable outlay in the provision of equipment to all schools now authorized to train Vehicle Mechanics. Indents for this equipment have already been submitted by some corps, but are being held in abeyance pending a decision on policy.

(f) That a survey be made of RCE trades leading up to the trade of Mechanist (M) to determine whether there is still a requirement for this trade when the Vehicle Mechanic commitment is removed, or whether the requirement can be met by one or two straight trades progressing from Gp 1 to Gp 4.

(g) That personnel now qualified as Vehicle Mechanics or Driver Mechanics in other corps be given the opportunity to transfer to RCEME if they so elect.

2 In view of the fact that a committee is being set up to study the introduction of Phase 2, RCEME, in Canada, it is considered that the recommendations outlined in sub-para (a), (b), (f) and (g) above should not be implemented at this time. It is recommended that they be passed to the committee studying Phase 2 for their consideration.

3 It is considered that the remainder of the recommendations in para 1 above should be implemented immediately. This should produce a better standard of training, and a considerable saving of public funds would result through the elimination of duplicate facilities. The centralization of Vehicle Mechanic training under one corps would be equally desirable on mobilization, for although considerable expansion will be necessary, it is considered that this will be effected by using the facilities of the Department of Labour, and having this coordinated by one corps would be most desirable.

4 If you concur in the above recommendations, action will be taken as follows:

(a) Instructions will be issued making RCEME responsible for the training of all Vehicle Mechanics.

(b) The trade of Vehicle Mechanic, Gp 1, will be introduced, and a trade specification prepared.

(c) The present trade specification for Driver Mechanic, Gp 1, will be re-written.

(d) Provision will be made for all personnel qualified as Driver Mechanics under existing regulations to be remustered as Vehicle Mechanics, Gp 1, if vacancies exist.

(e) A short conversion course will be drawn up to allow personnel qualifying as Driver Mechanics, Gp 1, in accordance with the new specification, to remuster as Vehicle Mechanics.

(f) The establishments of all corps schools now authorized to train Vehicle Mechanics will be reviewed in light of their revised commitment, and adjusted accordingly.

Original signed by Col Clift

(F.A. Clift)
Colonel
Director of Military Training

KHM/4388/var
copy/pc

ARMY DIVISION

PA → HQ 3202 - VG

ARMY HEADQUARTERS

new file

HQ 3045-1 (Trg 2)

OTTAWA, 27 Sep 50

ARMY TRADES SPECIFICATIONS

SUPPLEMENT NO. 4

Remustering of Driver Mechanic (W) and Driver Mechanic (T) Group 1 to Vehicle Mechanic (W) and Vehicle Mechanic (T) Group 1.

1 Consequent upon the introduction of the trades of Vehicle Mechanic (W), Gp 1, and Vehicle Mechanic (T), Gp 1, Driver Mechanics (W) and Driver Mechanics (T) now covering Vehicle Artificer or Vehicle Mechanic (W) or Vehicle Mechanic (T) vacancies will be remustered to the new trades above as applicable in the following manner:

Personnel now qualified as Driver Mechanics (W) or Driver Mechanics (T), or personnel qualifying on Driver Mechanic (W) or Driver Mechanic (T) courses authorized by Army Headquarters which terminated on or before 11 Aug 50, may be granted the qualification of Vehicle Mechanic (W) or Vehicle Mechanic (T), Gp 1, on the recommendation of Command EME, or other officer delegated by him, except for RCE personnel who may be granted qualification on the recommendation of the Command Engineer Officer or his representative. Remustering must be completed prior to 1 Sep 51.

2 Driver Mechanics (W) or Driver Mechanics (T) qualifying subsequent to 11 Aug 50, and Driver Mechanics (W) or Driver Mechanics (T) who do not remuster in accordance with the above, may only remuster to the trade of Vehicle Mechanic (W) or Vehicle Mechanic (T), Gp 1, upon successful completion of a conversion course authorized by Army Headquarters, or by trade test (if authorized).

for (Charles Foulkes)
Lieutenant-General
Chief of the General Staff

DHP/4388/ci

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No 1 Army Adm Unit

File No HQ 3202-V6 (DME)

OTTAWA, 29 Dec 50

Commanding Officer,
The RCEME School,
KINGSTON, Ontario

Trades Training
Veh Mech (Track)

I

Reference RCEMES 4-2-18-2
dated 16 Nov 50

1 In view of the fact that the candidates for this course will have the following qualifications, it is considered that your alternative 1(b) is the more suitable course:

(a) Each Driver Mech will have received equivalent training to former RCEME Driver Mechs. Since the latter were automatically remustered to Veh Mech (W) Gp I, it is felt that these candidates may be considered in the same light.

(b) Since the requirements for acceptance will call for a year of experience, there is much less likelihood of any candidate NOT being qualified, to the equivalent of Veh Mech (W) Gp I.

2 Your para 1(b) states in part "if candidates are graduates of our present Gp I Course". May this be clarified, as it is the understanding of this Directorate that the School is not running Gp I course for either Driver or Vehicle Mechanics.

(C R Boehm)
Colonel
Director of Mechanical Engineering

HB/4305

cc D Pers (Pers RCEME)

II

Pers (RCEME)

Ref min 5. preceding folio
1 Pls ensure that this ~~fact is~~ requirement is stipulated in the forming instructions

[illegible]
for DME

DEPARTMENT OF NATIONAL DEFENCE

PA → HQ 3202-V6

ARMY HEADQUARTERS

HQ 3666-V6 (Trg 2)

OTTAWA, 22 May 51

DME

Trade Specification
Vehicle Mechanic (Wheeled)

1 Reference three preceding folios and conversation Lt-Col McKibbin - Lt-Col Hamilton of 21 May 51.

2 In accordance with the existing Trade Specification (four folios down), Vehicle Mechanics cannot attain Group 3 qualification unless they have been employed in Base Workshops on the rebuilding of engines and other components. This requires considerable rotation of personnel, which is difficult in peace time, and much more difficult under field conditions. The difficulty is accentuated by the small proportion of personnel employed on major overhaul compared to the number employed on unit and field repairs. In a field formation, for example, Vehicle Mechanics in Div and Corps units could not obtain Group 3 qualification.

3 It is suggested that the specification should be rewritten to reflect the duties performed by the majority of Vehicle Mechanics within the Army, and that the major overhaul of components be written into the Job Description as a "may" requirement. If this were done the first paragraph of the Job Description might be worded as follows:

(a) Performs vehicle inspections, diagnoses faults, and modifies or repairs all wheeled or light tracked vehicles by adjustment, the replacement of assemblies and sub-assemblies, or the repair of certain minor assemblies. May be required to carry out the major overhaul of assemblies if employed with base units.

or

(b) Performs vehicle inspections, diagnoses faults, and carries out modifications and unit and field repairs to all wheeled or light tracked vehicles. May be required to carry out base repairs, including the major overhaul of vehicle assemblies.

4 Your comments on the above are requested.

(P.A. Clift)
Colonel
Director of Military Training

KHMcK/4388/DMD

2/6

PA → HQ 3202 - V6

ARMY HEADQUARTERS

HQ 3045-1 (Trg 2)

OTTAWA, 30 Nov 51

ARMY TRADES SPECIFICATION

SUPPLEMENT No 4

Remustering of Driver Mechanics (W) and Driver Mechanics (T) Group 1 to Vehicle Mechanics (W) and Vehicle Mechanics (T) Group 1

1 Personnel who are qualified as Driver Mechanics (Wheeled) or Driver Mechanics (Tracked), and who wish to remuster as Vehicle Mechanics (Wheeled) or Vehicle Mechanics (Tracked) Group 1 may do so in one of two ways:

(a) Pass the normal Vehicle Mechanic (Wheeled) or Vehicle Mechanic (Tracked) Group 1 course,

or,

(b) Pass the trade test for Vehicle Mechanics (Wheeled) or Vehicle Mechanics (Tracked) Group 1.

The method of qualification appropriate for each individual will depend upon the experience of the individual concerned. If he has been employed on maintenance only, and has had little repair experience, the normal course should be taken. If he has had an opportunity to gain experience at actual repair, he may be permitted to write the trade test.

2 This replaces Supplement No 4 dated 27 Sep 50. All copies of the old supplement will be destroyed.

for R.W. McLaren Lt Col

(G.G. Simonds)
Lieutenant-General
Chief of the General Staff

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All Directorates
No 1 Army Adm Unit
Secretary, Naval Trades Committee
Secretary, RCAF Trades Structure Committee

HQ 3203-B14 (Trg 2)
HQ 3667-3/1
HQ 3201-V6

In reply to WC 3667-3/1 (GS) over
WC 3201-406/33 (GS)
Dated 24 Jan 52

OTTAWA, 31 Jan 52

Headquarters,
Western Command,
Kingsway Ave.,
Edmonton, Alta.

Trades Qualification

1 Automatic qualification as Blacksmith Group 1 will not be granted for personnel in possession of Provincial Journeyman Certificates in the trade of Welder. However, candidates in the Reserve Force may be trade tested for qualification in accordance with para 14 (a) (ii) of Canadian Army Training Instruction No 9.

2 Provincial Journeyman Certificates in the trade of Motor Mechanics will be accepted as qualification for Vehicle Mechanics (Wheeled) and Vehicle Mechanics (Tracked) in accordance with para 15 (b) of Canadian Army Training Instruction No 9. When the specification for Vehicle Mechanics (Wheeled) is rewritten in the new form this method of qualification will be included.

(G.G. Simonds)
Lieutenant-General
Chief of the General Staff

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DEPARTMENT OF NATIONAL DEFENCE

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FROM CANARMY

ACTION ADDRESSEE/S WESCOM

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UNCLAS

ORIGINATOR'S NO. TRG 3729

8 MAY 52

RETEL G 1115 DATED 6 MAY 52 STOP AUTHORITY GRANTED TO QUALIFY PERSONNEL AS VEHICLE MECHANICS (WHEELED) GROUP 1 PROVIDED THEY ARE IN POSSESSION OF A PROVINCIAL JOURNEYMAN CERTIFICATE FOR MOTOR MECHANIC STOP PARA 15 (b) OF CATI NO 9 REFERS

P.A.

Clifford Kimpf on May

ORIGINATOR	TELEPHONE	DATE - TIME GROUP		FILE NO.
for Lieut-Gen CGS	4388/DMD	8/ 1850	Z	HQ 3202-V6 (TFE 2)

FILE COPY

3202 V6

S.N.S. 1220J-1500M-11-48 (2993)
S.A.F.S. 1616 (4 PARTS) - 1,500M-6-49 (2615)
N.Q. 224-21-S-1616
S.C.S.F. 343-500M-11-48 (8736)

HEADQUARTERS CENTRAL COMMAND

File: CCC 3340-V6/2 (EME)

Ortona Barracks
OAKVILLE, Ontario

16 SEP 52

Referred to DEME
SEP 20 1952
No. 3202-V6
Chgd to

Army Headquarters
Department of National Defence
OTTAWA, Ontario.

PA on WATHOMASH. 8 Oct 52.

PA

Attn: DEME

Qualification for Gp III
Vehicle Mechanic Wheeled

1 The Specifications for Army Trade and Specialties in connection with a qualification for the marginally noted trade effective date 12 MAY 52, states that in addition to Group II, the candidate must pass a trade test authorized by Army Headquarters and be certified by the Commanding Officer as being proficient in all functions of the trade.

2 The old Specifications, effective date, 1 AUG 50 stated that the candidate must only, in addition to Group II be certified in all the functions of the trade.

3 May para one above be clarified in that is it necessary that the candidate must pass a Trade Test authorized by Army Headquarters before he can be granted Gp III, and if so, may copies of these Trade Tests be passed to this Headquarters.

K R Ward

(K R Ward) Lt-col
Comd EME Central Comma

Filed on Mf

3202-V6 (1)

HQ ~~3310-80/0~~
14 Dec 53

PA

DMT

Amendment Courses Manual
Vehicle Mechanics (Tracked) Group 3

1. Attached to Appendix "A" is a rewrite of page N43 Courses Manual 1953-54.

2. The only change this amendment effects is to prevent the recovery mechanics Group 2 from taking the vehicle mechanics (tracked) group 3 course as experience over several courses has now shown clearly that the recovery mechanic group 2 is not able to keep up with other students on this course who have the alternate prerequisites of vehicle mechanics (tracked) group 2 or vehicle mechanics (wheeled) group 3.

3. It is requested that the attached amendment be published without delay and that Commands be requested to screen students selected for the course commencing 4 Jan 54.

4. Further to the above, reports from the RCEME School on candidates arriving for the tracked group 3 course commencing 23 Nov last, show that several candidates were only qualified as vehicle mechanics (wheeled) group 2 which indicates that units are still using 1952-53 Course Manual when referring to prerequisites. Three students with these prerequisites have had to be RTU'd, since 1953-54 course standards have been raised to the stage where vehicle mechanics (wheeled) group 2 can no longer take this training together with tradesmen of the senior group.

5. It is requested that the situation outlined in para. 4 above be brought to the attention of all commands in time to prevent a recurrence of this error in selectees for the 11 Jan 54 course.

J R Dunlop

(J R Dunlop)
Colonel
Director of Electrical and Mechanical Engineering

c.c. to PERS RCEME

DEPARTMENT OF NATIONAL DEFENCE

3202-V6

~~HQ 3610-V6~~ (ME 1)

ARMY HEADQUARTERS
OTTAWA, 19 Mar 56

Trade Qualifications
Vehicle Mechanics (Tracked) and (Wheeled)

1. The prerequisites for the vehicle artificer course state that a tradesman must be qualified as both a vehicle mechanic (tracked) group 3 and a vehicle mechanic (wheeled) group 3. Several queries have been received recently regarding the requalification of vehicle mechanics (tracked) as vehicle mechanics (wheeled) at various group levels.

2. A study has revealed that the training given in RCEME 123, vehicle mechanic (tracked) group 1 course, at The RCEME School, covers all the items contained in both the vehicle mechanic (tracked) group 1 and the vehicle mechanic (wheeled) group 1 standards.

3. Therefore, it has been decided that in future all candidates who successfully complete RCEME 123 at The RCEME School will be given the dual qualification of vehicle mechanic (tracked) group 1 and vehicle mechanic (wheeled) group 1.

4. Also, under authority of HQ 3610-V6 (ME 1) dated 20 Feb 56, Minute 2, dated 5 Mar 56, all RCEME personnel who are now qualified as vehicle mechanics (tracked) groups 1, 2 or 3 will be granted the additional qualification of vehicle mechanic (wheeled) group 1. Commanding officers of RCEME units having such personnel on strength will initiate Part II Order action to show this additional trade qualification.

5. This ruling should greatly simplify the requalification of vehicle mechanics (tracked) as vehicle mechanics (wheeled) and their upgrading in the two trades.

6. Because a vehicle mechanic (wheeled) may be qualified to the group 3 level in the field, and the vehicle mechanic (tracked) must attend a course at The RCEME School to be qualified to the group 3 level, there is a danger that the Corps will lose vehicle mechanics (tracked). Unit commanders, while doing all possible to have their vehicle mechanics upgraded to the group 3 level in both trades, must ensure that the vehicle mechanics (tracked) do not lose their identity by being continually employed as vehicle mechanics (wheeled).

7. It is hoped that this new ruling will overcome some of the problems which previously existed in the requalification of vehicle mechanics (tracked) as vehicle mechanics (wheeled) in order to qualify for the vehicle artificer course.

KRCWard Lt Col

for (JR Dunlop)
Colonel
Director of Electrical and Mechanical Engineering

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Vehicle Mechanic (Tracked)
Group 1, 1954

DND 3045-1 (A)

FILE NUMBER 3202-V6 **VOL.** 1

DEPARTMENT OF NATIONAL DEFENCE

POLICY OF TRAINING &QUALIFICATIONS

VEHICLE MECHANICS

FOR CROSS REFERENCES SEE INSIDE COVER

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VOL. 1 FILE NUMBER 3202-V6

ARMY

3202-V6

RS 3667-1(CI)

DEPARTMENT OF NATIONAL DEFENCE
THE RCEME SCHOOL

Kingston, 21 Jun 54

Referred to D.E.M.E
JUN 24 1954
File No 3202-V6
Chgd to

Army Headquarters
Dept of Nat Defence
Ottawa, Ontario

ORIGINAL on HQ 3202-V6

Attn; ADEME(P & T)

Training Standards

1. Herewith for your retention are six copies of proposed training standards for each of the following trades

Body Repairman, Group 3
Body Repairman, Group 1
Vehicle Mechanic (Tracked) Group 3
Vehicle Mechanic (Tracked), Group 1
Vehicle Mechanic (Wheeled), Group 3
Vehicle Mechanic (Wheeled, Group 1

(C. W. Jones), Colonel
Commandant
The RCEME School

Encl

HKW/5501 L 7

To File: Remaining copies retained by DEME on 4-3-2
W.A. Thomas
for ADEME P.&T.

Original on H.Q. 3202-B22

28 JUN 1954

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 1

Aim

1. To qualify candidates as Vehicle Mechanics (Tracked) Group 1.

Application

2. The lessons that should be covered and the reference texts of which a knowledge is required in order to reach each standard are set out opposite the standard concerned.

3. The number of lessons thus indicated bears no relation to the number of periods which may be required to teach the lessons.

4. The decision as to the number of periods necessary in any subject will be made by the officer directly concerned with the training in that subject.

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 1

INDEX

Serial	Subject
1	Bench Fitting and Shop Practice
2	Repair and Overhaul
3	Testing and Adjusting Installed Components
4	Replacing Components
5	Servicing
6	Driving

NOTE: Personnel must have completed Corps Training and be qualified as Driver (Wheeled) before undertaking this standard.

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
1	Bench Fitting and Shop Practice	Must know: Shop Safety Precautions in the prevention of accidents and the correction of unsafe working conditions and circumstances including use of hand and portable power tools, general shop equipments, handling of materials and inflammables.	RCEME School Precis No 2-1-1
		Must know: The care and use of Mechanics hand tools contained in Chests Tool Fitters Mk 3.	CAMT 8-8 Appendix -ABCs of Hand Tools
		Must know: The use of common measuring devices-rules, combination, square, dividers, inside and outside calipers.	General Repair Tools - Delmar Pages 24-28
		Must be capable of: Reading simple mechanical drawings.	Blueprint Reading for Beginners - Delmar Pages 1-9
		Must be able to: Carry out simple projects in work layout.	Bench Work - Delmar Pgs 6,7-12, 41-59
		Must be able to: (a) Correctly identify and select common hand files (b) Carry out simple filing projects.	File Filosophy - Nicholson File Co Pages 1-47

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
1	Bench Fitting and Shop Practice	Must be able to:	General Repair Tools - Delmar
		(a) Identify thread types by use of thread gauges	Pages 29.
		(b) Select taps and dies	Pages 117-129
		(c) Carry out simple tapping and threading operations	
		(d) Correctly use tap extractors and "Ezy-outs"	Pages 136-138
		Must be able to:	Drill Press Work - Delmar
		Carry out simple drilling and grinding operations using twist drills, drill presses, holding devices, portable electric drills, bench and pedestal grinders.	Pages 1-35 General Repair Tools - Delmar Pages 98-116, 139-150
		Must have a general knowledge of:	Oxy-Acetylene Handbook - Linde Air Products
		The operations and safety precautions in the use of Oxy-Acetylene cutting and welding equipment	Pages 92-101 RCEME School Precis No 2-1-1 Para 10
		Must be able to:	Hand Processes - Delmar - Pages 1-7
		Correctly use soldering equipment, fluxes, and perform simple soldering operations.	General Repair Tools - Delmar Pages 76-96
		Must be able to:	TM10 - 590 - Page 66 TM 5 - 225 Para 123(a)
		Cut, anneal, flare and fit copper and steel tubing	

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
2	Repair and Overhaul	Must have a general knowledge of:	
		Automotive and Tracked Vehicle Shop tools, how and where they are used, and their care and maintenance.	
		Must know:	CAMT 8-8 Chaps 1,2&3 TM 9-2700 Chap 3
		(a) The basic principles of the operation and components of the IC Engine, and CI engines, including 2 and 4 stroke cycle engines	Secs 1 & 2 (Less Radial Eng) Film TF10-166 Film SS-678
		(b) The basic principles and function, location and operations of the cooling system components, including pressurized system.	CAMT 8-8 Chap 8 FM 9-2700 Chap 8 Secs 1 & 2 Film TF 10-319
		(c) The basic principles of carburation and operation of IC and CI fuel supply systems, including Diesel fuel injection equipment.	CAMT 8-8 Chaps 4 & 5 Film SS-741 Film SS-1096 Film SS-383 TM9-2700 Chaps 5 & 6
		(d) The basic principles of the operation and functior of the power train units, including - clutches, transfer Units, standard and automatic transmissions standard and controlled differentials, final drives, propeller shafts and universal joints, and constant velocity universal joints.	TM9-2700 Chaps 13-17 Film TF9-1213 Film TF9-1285 Film TF9-1001 Film TF9-1002 CAMT 8-8 Chaps 9-12

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
2	Repair and Overhaul	Must know: The basic principles of operation, location and function of the suspension and running gear including - (a) Wheels, rims, brake drums and shoes (b) Types of bearings (c) Mechanical, hydraulic and power brakes (d) Steering systems (e) Road springs and shock absorbers (f) Front and rear axle assemblies (g) Frames (h) Hulls, turrets, and power traverse (i) Tracks and suspensions	TM9-2700 Chaps 18-22 Film TF-299 Film TF10-593 Film TF10-594 Film TF10-638 CAMT 8-8 Chaps 14 ·23 TM9-2700 with Annexure CI - Chaps. 18-22
		Must know: The basic principles of DC electricity, Ohms Law, simple circuits and magnetism, and the function and operation of vehicle electrical system components including:	CAMT 8-8 Chaps 24-28 TM9-2700 Chaps 7,10-12 Film TF10-639 Film TF9-2076 Film TF9-2077 Film TF9-2078

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
2	Repair and Overhaul	(a) Instruments (b) Storage batteries and battery servicing (c) Battery and magneto ignition (d) Generators and regulators (e) Auxilliary chargers (f) Starting motors (g) Solenoids, switches, lights, horns, gauges and wiring harness (h) Radio interference & suppression	Film TF9-2079 Film TF11-2100 Film TF9-1554
		Must have a general knowledge of:	
		Elementary mathematics and physics including, whole numbers, common fractions, decimal fractions, averages and square root, ratio and proportion; laws of motion, work, power and energy, and simple machine elements,	TM9-2820 Chaps 2,3,4,6&8
		Must have a general knowledge of:	TM9-2700 Paras 37-40, & 63
		Fuel and lubricant characteristics, including gasolines, diesel fuels, engine oils, heavy gear lubricants, miscellaneous oils and greases.	TM9-2835 Sec 2 & 3 CAEMEIs - GEN N601 - 3,5,7 N602 -1 CAO 214-1

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
3	Testing and Adjusting Installed Components	Must be capable of: Using simple test equipment, including compression and vacuum gauges, timing light and voltmeters, hydrometers - battery and anti-freeze testing.	Operating Manual Weidenhoff Engine Analyser - Secs 3, 9, 10, and 11
4	Replacing Components	Must be able to: Replace minor components, using correct sequence and tools, including batteries and cables, coolant hoses and thermostats, fan belts, oil & fuel filters & cartriges, cover gaskets.	Vehicle Manuals applicable to equipments in use.
5	Servicing	Must know: The fundamentals of lubrication, the use of hand and power lubricating equipment and lubrication charts, the correct methods of oil changing and greasing.	TM9-2835 Sec 2, Para 2-11 Sec 5, Para 23-28 Maintenance Manuals applicable to equipments in use
		Must be capable of: Carrying out seasonal servicing.	Maintenance Manuals applicable to equipments in use
6	Driving	Must know: Safety precautions and practices in the mounting, dismounting, operation and movement of wheeled and tracked AFVs.	RCEME School Precis No. 6-17-2 Drivers Handbook M4A2E8 Section 5

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
6	Driving	Must be able to: Carry out correct starting and stopping procedure on wheeled and tracked AFVs. Must know and be given practice in: The correct use of controls including throttle, steering and braking, clutch and gear changing.	Vehicle Manuals applicable to equipments in use

Vehicle Mechanic (Tracked)
Group 3, 1954

DND 3045-1 (A)

FILE NUMBER 3202-V6 **VOL.** 1

DEPARTMENT OF NATIONAL DEFENCE

POLICY OF TRAINING &QUALIFICATIONS

VEHICLE MECHANICS

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VOL. 1 FILE NUMBER 3202-V6

ARMY

3202-V6

TRAINING STANDARD

THE ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 3

Aim

1. To qualify candidates as Vehicle Mechanics (Tracked) Group 3.

Application

2. The lessons that should be covered and the reference texts of which a knowledge is required in order to reach each standard are set out opposite the standard concerned.

3. The number of lessons thus indicated bears no relation to the number of periods which may be required to teach the lessons.

4. The decisions as to the number of periods necessary in any subject will be made by the officer directly concerned with the training in that subject.

TRAINING STANDARD

THE ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 3

Aim

1. To qualify candidates as Vehicle Mechanics (Tracked) Group 3.

Application

2. The lessons that should be covered and the reference texts of which a knowledge is required in order to reach each standard are set out opposite the standard concerned.

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TRAINING STANDARD

THE ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 3

INDEX

Serial	Subject
1	Bench Fitting and Shop Practice
2	Repair and Overhaul
4	Replacing Components
7	Fault Finding
8	Inspection
10	Testing and Adjusting
11	Recovery

TRAINING STANDARD

THE ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHCILE MECHANIC (TRACKED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
1	Bench Fitting & Shop Practice	Must have a general knowledge of:	Machine Shop Theory & Practice - Wagener & Arthur
		Abrasives, bonding and grinder attachments, and be capable of removing, replacing and dressing grinding wheels common to the trade using diamond and rotary wheel dressers.	Pages 240-243, 231& 224. RCEME School Precis # 2-1-1 Film # AF 270
		Must be capable of:	
		Correctly using all precision gauges and measuring devices common to the trade including protractors, levels, surface plates & surface gauges, inside & outside micrometers.	General Repair Tools - Delmar Unit A-P-~~1~~ 2 Pages 35-52
		Must be able to:	Blueprint Reading for Beginners - Delmar
		Prepare simple free hand dimensional working sketches as necessary to illustrate job and shop requirements within his scope of operations.	Pages 10, 14, 18, 24, and 41.
2	Repair and Overhaul	Must be able to:	
		Carry out by the replacement of defective parts - (a) Minor engine overhauls including valve piston ring jobs, and fitting new bearing inserts. (b) Repairs to components of the ~~tool~~ fuel and cooling systems (gasoline & diesel engines)	Maintenance Manuals applicable to equipments in use.

TRAINING STANDARD

THE ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VECHICLE MACHANIC (TRACKED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
2	Repair and Overhaul	Must be able to:	
		Carry out repairs to tracks and components of the suspension system by the replacement of parts.	Maintenance Manual applicable to equipment in use
		Must be capable of:	
		Making light repairs to electrical components by the replacement of parts and correctly making all necessary internal connections, including commutator servicing, brushes and contacts, bearings, bushings and driving members.	Maintenance Manual applicable to equipment in use
		Repairing & overhauling braking systems on wheeled & tracked AFVs & mobile equipment by the replacement of parts; including mechanical, hydraulic & power braking systems & steering brake mechanisms.	Maintenance and Service manuals applicable to equipment in use
4	Replacing Components	Must be capable of:	
		Removing & replacing complete engine assemblies using proper sequence, tools & rigging in wheeled & tracked AFVs, & mobile equipments	Maintenance and Service manuals applicable to equipments in use.
		Must be capable of:	
		Removing & replacing the complete major hull components, including turrets and power traverse on wheeled & tracked AFVs using proper sequence, tools & rigging	Maintenance and Service manuals applicable to equipments in use.

TRAINING STANDARD

THE ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
4	Replacing Components	Must be capable of: Removing & replacing major components of the power train on wheeled & tracked AFVs & mobile equipments, employing proper sequence, tools & rigging.	Maintenance and Service manuals applicable to equipments in use.
7	Fault Finding	Must be able to: Recognize, locate & rectify malfunctions in the Electrical & fuel systems, engine operation, power train, running gear & suspension, by employing systematic procedure, correct sequence, & proper use of instruments & equipment.	Service diagnosis corrective methods outlined in applicable maintenance manuals for equipments in use.
8	Inspection	Must know and be able to: Carry out RCEME inspection procedure as a member of a vehicle inspection team, & assign maintenance gradings & condition classification.	CAEMEIs Vehicles A103 Instr 1-4 A104 Instrs 1-7
		Must be capable of: Estimating the parts & labour required to repair vehicle & special equipments of the trade.	RCEME Corps Instr. WKSP No 39 CAO 52-2 Part 1, para 7, and part 2 para 4(6)
		Must know and be able to: Carry out the correct procedure of ordering necessary spare parts for completion of repairs.	RCEME Corps Instr WKSP/PROD No 205

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TRAINING STANDARD

THE ROYAL CANADIAN ELECTRICAL AND MEHCANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
10	Testing & Adjusting	Must be capable of:	
		Using approved methods, tools and equipment to perform efficiency tests and all major adjustments on-	Service and Maintenance manuals applicable to equipments in use.
		(a) Generator regulators	
		(b) Governors (gasoline and diesel engines)	
		(c) Steering brakes	
		(d) Clutch linkages	
		(e) Standard and automatic transmissions	
		(f) Diesel fuel system components	
		(g) Steering & front end alignment	
		(h) Mechanical, hydraulic & power braking systems.	
11	Recovery	Must have a general knowledge of:	
		Recovery team essentials, use of casualty cards, recovery rules and safety precautions.	RCEME School Precis No 6-26-1 Para 1-12 Film C605 CAEMEIs GEN G070
		Must have a general knowledge of:	
		(a) Hemp rope, care & use, knotting and spliding	RCEME School Precis No 6-26-3 TM5-225 Chap 2.

TRAINING STANDARD

THE ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (TRACKED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
11	Recovery	(b) Wire rope, care & use, selection, lay, grade & loads, use of thimbles, clamps and splicing.	RCEME School Precis No 6-26-2 TM5-225 Chap 3
		Must have a general knowledge of:	
		(a) Selecting suitable recovery equipments for proper capacities, winches, booms, and stowage.	RCEME School Precis No 6-26-1 Paras 13-26 Film C-497 Film C-498 Film C-605 Film C-789
		(b) Forming simple & compound layouts, and removing casualties from heavy terrain.	
		Must have a general knowledge of:	
		Soil characteristics, and breakdown vehicle operation over - snow, ice, shale, rock, sand, mud and bog.	Manual of Recovery (c) Pt 1.
		Must be capable of:	
		Efficiently operating meduim and heavy breakdown vehicles, including winching, lifting, loading and towing.	Maintenance and operators manuals applicable to equipments in use.
		Must be capable of:	
		Efficient operation of crawler tractors for recovery duty including winching, skidding and towing.	Maintenance and operators manuals applicable to equipments in use.

Vehicle Mechanic (Wheeled)
Group 1, 1954

DND 3045-1 (A)

FILE NUMBER 3202-V6 **VOL.** 1

DEPARTMENT OF NATIONAL DEFENCE

POLICY OF TRAINING &QUALIFICATIONS

VEHICLE MECHANICS

FOR CROSS REFERENCES SEE INSIDE COVER

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VOL. 1 FILE NUMBER 3202-V6

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TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 1

Aim

1. To qualify candidates as Vehicle Mechanics (Wheeled) Group 1

Application

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TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 1

Index

Serial	Subject
1	Bench Fitting and Shop Practice
2	Repair and Overhaul
3	Testing and Adjusting Installed Components
4	Replacing Components
5	Servicing

NOTE: Personnel must have completed Corps Training and be qualified as Driver (Wheeled), before undertaking this standard.

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
1	Bench Fitting and Shop Practice	Must know:	RCEME School Precis No 2-1-1
		Shop safety precautions in the prevention of accidents and correction of unsafe working conditions and circumstances, including use of hand and portable power tools, general shop equipments, the handling of materials and inflammables.	
		Must know:	CAMT 8-8 Appendix ABC's of Hand Tools
		The care and use of mechanic's hand tools contained in chests tool fitter's Mk 3.	
		Must know:	
		The use of common measuring devices rules, combination square, dividers, inside and outside calipers.	General Repair Tools Delmar P 24-28
		Must be capable of:	Blueprint Reading for Beginners - Delmar P 1-9
		Reading simple mechanical drawings	
		Must be able to:	Bench Work - Delmar P 6,7,12,41-59
		Carry out simple projects in work layout	
		Must be able to:	
		(a) Correctly identify and select common hand files	File Filosophy Nicholson File Co P 1-47
		(b) Carry out simple filing projects	

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCES
(a)	(b)	(c)	(d)
1	Bench Fitting and Shop Practice	Must be able to: (a) Identify thread types by use of thread gauges. (b) Select taps and dies (c) Carry out simple threading and tapping operations (d) Correctly use tap extractors and Ezy-Outs	General Repair Tools P 29,11,7-129,4, 136-138
		Must be able to: Carry out simple drilling and grinding operations using twist drills, drill presses, holding devices, and portable electric drills, bench and pedestal grinders.	Drill Press Work Delmar P 1-35 General Repair Tools Delmar P 98-116, 139-150
		Must have a general knowledge of: Operations and safety precautions in the use of oxy-acetylene cutting and welding equipment	Oxy-Acet Handbook - Linde Air Products P 92-101, RCEME School Precis No 2-1-1 Para 10
		Correctly use soldering equipment fluxes and perform simple soldering operations	Hand Processes - Delmar P 1-7 General Repair Tools Delmar P 76-96
		Must be able to: Cut, anneal, flare and fit copper and steel tubing.	TM 10-590 P 66 TM 5-225 Para 123 (a)

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCES
(a)	(b)	(c)	(d)
2	Repair and Overhaul	Must have a general knowledge of: Automotive vehicle shop tools, how and where they are used and their care and maintenance Must know:	
		(a) The basic principles of the operation and the components of the I.C. Engine and the C.I. Engine, including 2 and 4 stroke cycle engines	CAMT 8-8 Chaps 1,2,3 TM9-2700 Chap 3 Secs 1&2 (less radial engine) Film TF 10-166 SS-678
		(b) The basic principles and function, location and operation of the cooling system components, including pressurized system	CAMT 8-8 Chap 8 FM9-2700 Chap 8 Secs 1&2, Film TF 10-319
		(c) The basic principles of the carburetion and operation of I.C. and C.I. fuel supply systems, including diesel fuel injection equipment	CAMT 8-8 Chap 4,5 Films SS-741, SS-1086, SS-383 TM9-2700 Chaps 5&6
		(d) The basic principles of the operation and function of the power train units, including clutches, transfer cases, standard and automatic transmissions, standard and controlled differentials, propeller shafts and universal joints and constant velocity universal joints	CAMT 8-8 Chaps 9-12 Films TF9-1213 TF9-1285 TF9-1001 TF9-1002 TM9-2700 Chaps 13-17

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCES
(a)	(b)	(c)	(d)
2	Repair and Overhaul	Must know: The basic principles of operation, location and fuction of the running gear, including - (a) Wheels, rims, brake drums and shoes (b) Types of bearings (c) Mechanical, hydraulic and power brakes (d) Steering systems (e) Road springs and shock absorbers (f) Front and rear axle assemblies (g) Frames	CAMT 8-8 Chaps 14-23 TM9-2700 Chaps 18-22 (Excl. Track Equipment) Films TF10-299 TF10-593 TF10-594 TF10-638
		Must know: The basic principles of D.C. electricity, Ohm's law, simple circuits and magnetism, and the function and operation of vehicle electrical system components, including: (a) Instruments (b) Storage batteries and battery servicing (c) Battery and magneto ignition (d) Generators & regulators	CAMT 8-8 Chaps 24-28 TM9-2700 Chaps 7,10-12 Films TF10-639 TF9-2076 TF9-2077 TF9-2078 TF9-2079 TF9-1554 TF11-1200

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
2	Repair and Overhaul	(e) Auxiliary chargers (f) Starting motors (g) Solenoid switches, lights, horns, gauges and wiring harnesses (h) Radio interference supression	
		Must have a general knowledge of:	
		Elementary mathematics and physics including - whole numbers, common fractions, decimal fractions, average and square root, ratio and proportions, laws of motion, work, power and energy, and simple machine elements	TM9-2820 Chaps 2,3,4,6,8
		Must have a general knowledge of:	
		Fuel and lubricant characteristics including - gasolines, diesel fuels engine oils, heavy gear lubricants miscellaneours oils and greases	TM9-2700 Paras 37-40 & 63 TM9-2835 Sec 2,3 CAEMEIs - Gen N 601 -3,5&7 N 602 - 1
		Must know:	CAO 214-1
		Types of road wheels and the maintenance, care, mounting and dismounting, storage and emergency repairs of tires and tubes	TM31-200 Chap 1 Sec 1,2,5,6&7
3	Testing and Adjusting Installed Components	Must be capable of:	
		Using simple test equipment including - Compression and vacuum gauges, timing lights, voltmeters, hydrometers, battery and anti-freeze testing	Operating manual Weidenhoff Engine Analyser Secs 3,9,10&11

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 1

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
4	Replacing Components	Must be capable of:	
		Replacing easily accessible minor components using correct sequence and tools, including - batteries and cable, coolant hoses and thermostats, fan belts, oil and fuel filters and cartridges, cover gaskets	Vehicle Manuals applicable to equipments in use
5	Servicing	Must know:	
		Fundamentals of lubrication, the use of hand and power lubricating equipment and lubrication charts, the correct methods of oil changing and greasing	TM9-2835 Sec 5 Para 23-28 Sec 2 Para 2-11 Maintenance Manuals Applicable to Vehicles in use
		Must be capable of:	
		Carrying out seasonal servicing	Maintenance Manuals Applicable to equipments in use.

Vehicle Mechanic (Wheeled)
Group 2, 1954

DND 3045-1 (A)

FILE NUMBER 3202-V6 **VOL.** 1

DEPARTMENT OF NATIONAL DEFENCE

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ARMY

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IN REPLY PLEASE QUOTE
No. RS 3202-1(CI)

CANADA

Department of National Defence

THE RCEME SCHOOL

1954 JUL 15 AM 8:40

REFERED TO DEME
FILE 3202-V6
CHG'D TO

Reference is made to telephone conversation of Major Sloan--Major Campbell on 12 Jul 54.

KINGSTON, 13 Jul 54.

(2) Duplicate copies of these

20 JUL 1954

Standards held by DEME
W A Thomas
Lt

Army Headquarters,
Dept of Nat Defence,
OTTAWA, Ontario.

(1)

Attn: ADEME(P & T)

Training Standard --
Veh Mech (W) Gp 2

1 Enclosed herewith are twelve copies of the marginally-noted training standard.

Enc

HEMc/5501 L 106

Major
(C W Jones), Colonel,
Commandant,
The RCEME School.

C.A.F.A. 23
1 MIL.—5-51 (4815)
H.Q. 224-21-A-23

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC .. (WHEELED) GROUP 2

Aim

1. To qualify candidates as Vehicle Mechanic (Wheeled) Group 2

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TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 2

INDEX

Serial	Subject
1	Bench Fitting and Shop Practice
2	Repair and Overhaul
3	Testing and Adjusting Installed Components
4	Replacing Components
5	Servicing
6	Fault Finding
7	Inspection
8	Interpretation of Technical Publications

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 2

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
1	Bench Fitting and Shop Practice	Must be able to: (a) Correctly use available shop presses, remove and replace pins, shafts, bushings, ball and roller bearings.	General Repair Tools, Manual "A" - Delmar Pages 152-161
		(b) Select reamers of the correct size and type, and perform reaming operations to specified fits.	General Repair Tools, Manual "A" - Delmar Page 162-170
		Must be capable of: Identification and selection of various types of cold rivets, and performing simple rivetting operations using correct tools.	TM 10-590 Para 21
		Must be capable of: Servicing hand tools, including, grinding and sharpening of chisels, punches, screwdrivers, twist drills and fitting hammer handles.	TM 9-367 Pages 36-38 Pages 74-76 Pages 92-95 Pages 14-23 Pages 47-50
		Must be capable of: Setting up and correctly using dial indicators, to determine out of round or "run-Out" conditions.	General Repair Tools - Manual "A" - Delmar Pages 31, 46, 47, 48
2	Repair and Overhaul	Must be capable of: Reseating and refacing Engines valves, making proper use of valve and seat reconditioning equipment.	TM 9-1834A Part 4 Secs 11 & 12 TM5-4730 (Entire)

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 2

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
2	Repair and Overhaul	Must be capable of: Reconditioning components of Mechanical and Hydraulic braking systems, including linkages, relining shoes, wheel and master cylinders and booster units.	Maintenance Manuals applicable to equipments in use
		Must be able to: Recondition mechanical type gasoline fuel pumps by the replacement of parts.	TM 9-1828A Sections applicable to equipment
3	Testing and Adjusting Installed Components	Must be able to: Carry out minor brake shoe and linkage adjustments, bleed the hydraulic system and make functional tests of brake components.	Maintenance Manuals applicable to equipments in use
		Must be able to: Carry out functional tests and minor steering adjustments including gear box and toe-in and testing of tie-rod ends and drag link end plugs.	Maintenance Manuals applicable to equipments in use
		Must be able to: Carry out minor clutch linkage adjustment including free pedal travel and hand operated air assists.	Maintenance Manuals applicable to equipments in use
		Must be able to: Carry out operational test [illegible]	

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 2

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
3	Testing and Adjusting Installed Components	Must be able to: Carry out operational tests and simple adjustments of the electrical system components excluding regulator units but including spark plugs, distributor point setting and timing, starting motor, generators, lights horns, gauges and wiring.	Automotive Electrical Equipments - Crouse Pages 282, Pages 284, Pages 100-106, Pages 221-224, Pages 304-306, Pages 238-256, Pages 302, Pages 323-324.
		Must be able to: Carry out linkage adjustments and engagement tests on standard and automatic transmissions and transfer cases.	Maintenance Manuals applicable to equipment in use
		Must be able to: Determine servicability and adjust wheel bearings	Maintenance Manuals applicable to equipment in use
		Must be capable of: Making running adjustments and field tests on gasoline and diesel fuel systems	Maintenance Manuals applicable to equipment in use
		Must be capable of: Making field tests and running adjustmenst on all engines components including valve operating mechanism, governors, control linkages, cooling and lubrication systems.	Maintenance Manuals applicable to equipment in use

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANICAL (WHEELED) GROUP 2

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
3	Testing and Adjusting Installed Components	Must be capable of: Testing and adjusting installed components on motorcycles including: (a) Engine valve adjustments (b) Electrical system and ignition controls (c) Fuel system and controls (d) Lubrication system (e) Gear shift linkage (f) Clutch, controls hand & foot (g) Primary and seconary drive chains (h) Steering head and handle bars (j) Brakes hand & foot controls	TM 9-2700 Pt 7 Chapter 25 Maintenance Manuals applicable to equipments used.
4	Replacing Components	Must be capable of: Removing and replacing complete engine assemblies using proper sequence, tools and equipment.	Maintenance Manuals applicable to equipment in use
		Must be capable of: Removing and replacing minor and major components of the power train using proper sequence tools and equipment.	Maintenance Manuals applicable to equipment in use
		Must be capable of: Removing and replacing running gear of wheeled vehicles including springs, shock absorbers, front and rear axle and wheel assemblies.	Maintenance Manuals applicable to equipment in use

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TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 2

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
4	Replacing Components	Must be capable of: Removing and replacing electrical components and making all necessary connections including units of the starting, ignition, charging systems and assessories.	Maintenance Manuals applicable to equipment in use
		Must be capable of: Removing and replacing gasoline and diesel fuel system components making all necessary connections including reservoirs, high and low pressure lines, filters pumps, carburetors and injectors	Maintenance Manuals applicable to equipment in use
		Must be capable of: Removing and replacing cooling system components making all necessary connections including radiators, oil coolers, pumps, fans and shrouds.	Maintenance Manuals applicable to equipment in use
		Must be capable of: Removing and replacing components of mechanical and hydraulic braking systems making all necessary connections including operating linkages, brake shoes, anchors, backing plates, drums, wheel master and slave cylinders, lines and booster assemblies.	Maintenance Manuals applicable to equipment in use
		Must be able to: Remove and replace all motorcycle components and assemblies	Maintenance Manuals applicable to equipments in use

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 2

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
5	Servicing	Must have a general knowledge of: The purpose, procedure and materials used in the temporary, Limited and Long Term Preservation of wheeled vehicles and their components.	CAEMEIs Vehicle General "A" 353, 354
6	Fault Finding	Must be able to: Locate and rectify simple faults in the operation of (a) Ignition systems (b) Gasoline and diesel fuel systems (c) Air and liquid cooling systems (Including purging and reverse flushing) (d) Engine compression losses (e) Power train (f) Wheeled vehicle running gear	Service Diagnosis and corrective methods outlined in applicable Maintenance Manuals for equipments in use
7	Inspection and Classification	Must have a general knowledge of: The procedure for inspecting and determining the condition classification of all equipment coming into and going out of workshops	CAEMEIs Vehicle General "A" 103 Inst NO 3 104 Inst No 3
8	Interpretation of Technical Publication	Must be capable of: Obtaining necessary information by the proper selection and interpertation of available technical publications including:	

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 2

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
8 T	Interpretation of Technical Publication	(a) Blue prints & mechanical drawings (b) Maintenance manuals (c) Spare parts lists (d) Manufacturers bulletins (e) Canadian Army Electrical & Mechanical Engineering Instructions.	

Vehicle Mechanic (Wheeled)
Group 3, 1954

DND 3045-1 (A)

FILE NUMBER 3202-V6 **VOL.** 1

DEPARTMENT OF NATIONAL DEFENCE

POLICY OF TRAINING &QUALIFICATIONS

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VEHICLE MACHANIC (WHEELED) GROUP 3

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VEHICLE MECHANIC (WHEELED GROUP 3

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TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
1	Bench Fitting and Shop Practice	Must have a general knowledge of:	
		Abrasives, bonding, and grinder attachments and must be capable of removing, replacing and dressing grinding wheels common to the trade using diamond and rotary wheel dressers	Machine Shop Theory & Practice - Wagener & Arthur Pages 240-243, 231, 224 RCEME School Precis 2-1-1 Film AF 270
		Must be capable of:	
		Correctly using all precision gauges and measuring devices common to the trade, including - protractors, levels, surface plates and surface gauges, inside and outside micrometers.	General Repair Tools - Delmar Unit A-P-2 Pages 35-52
		Must be able to:	
		Prepare simple free hand dimensional working sketches as necessary to illustrate job and shop requirements within the scope of the operations.	Blueprint Reading for Beginners - Delmar Pages 10,14,18, & 24,41.
2	Repair and Overhaul,	Must be able to:	
		Carry out by the replacement of defective parts:	
		(a) Minor engine overhauls including valve, piston ring jobs, and fitting new bearing inserts,	Maintenance Manuals applicable to Vehicles in use
		(b) Repairs to components of the fuel, & cooling systems, gasoline & diesel engines.	

7

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
2	Repair and Overhaul	Must be able to:	
		Carry out repairs to running gear components by the replacement of parts including suspension and steering systems.	Maintenance Manuals applicable to Vehicles in use
		Must be capable of:	
		Making light repairs to electrical components by the replacement of parts and correctly making all necessary internal connections including - commutator servicing, brushes and contacts, bearings, bushings, and driving members	Maintenance Manuals applicable to Vehicles in use
		Must be capable of:	
		Overhauling & repairing by replacement of defective parts, power brake components, including vacuum, air & electric systems.	Maintenance Manuals applicable to Vehicles in use
		Must be capable of:	
		Complete stripdown overhaul and repair of motorcycles, including - fork and wheel straightening	Maintenance Manuals applicable to Vehciles in use
6	Fault Finding	Must be able to:	
		Recognize, locate and rectify malfunctions in the electrical and fuel systems, engine operation, power train and running gear by employing systematic procedure, correct sequence and proper use of equipment and instruments	Service Diagnosis and corrective methods outlined in applicable Maintenance Manuals for equipment in use

TRAINING STNADARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
7	Inspection	Must know and be able to:	
		Carry out Royal Canadian Electrical and Mechanical Engineers inspection procedure as a member of a vehicle inspection team and assign maintenance grading and condition classification	CAEMEIs - Veh Gen "A" 103 Instr 1,2,3,4, Veh Gen A104 1-7
		Must be capable:	RCEME Corps Instr Wksp No 39
		Estimating the parts and labour required to repair vehicles and special equipments of the trade	CAO 53-2 Part I Para 7, and Part 2 Para 4(b)
		Must know and be able to:	
		Carry out the correct procedure of ordering necessary spare parts for completion of repairs	RCEME Corps Instr Wksp/Prod No 205
9	Testing and Adjusting	Must be capable of:	Service & Maintenance Manuals applicable to equipments in use
		Using approved methods, tools and equipment to perform efficiency tests and all major adjustments on:	
		(a) Generator regulators	
		(b) Governors (gasoline & diesel engines	
		(c) Front end alignment	
		(d) Wheel balancing	
		(e) Standard and automatic transmissions	
		(f) Diesel fuel system components	

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
9	Testing and Adjusting	(g) Brakes Mechanical, Hydraulic, & power systems (h) Frame alignment (testing only)	
10	Recovery	Must know: Recovery team essentials, use of casualty cards, recovery rules and safety precautions	RCEME School Precis No 6-26-1, Para 1-12 Film C605 CAEMEIs GEN G070
		Must have a general knowledge of:	
		(a) Hemp ropes, care and use, knotting and splicing	RCEME School Precis, No 6-26-3 TM 5225, Chap 2
		(b) Wire rope, care and use, selection, lay, grade and loads, use of thimbles, clamps and splicing	RCEME School Precis 6-26-2 TM 5225, Chap 3
		Must be capable of:	RCEME School Precis No 6-26-1 Para 13-26
		(a) Selecting suitable recovery equipments for proper capacities, winches, boom and stowage.	Film C497 Film C605 Film C-789
		(b) Forming simple and compound layouts and removing casualty from heavy terrain	RCEME School Precis No 6-26-1 Para 13-26 Film C497 Film C605 Film C-789
		Must have a general knowledge of:	
		Soil characteristics, and breakdown vehicle operation over shale, rock, ice, snow, sand, mud and bog	Manual of Recovery (C) PartI

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

VEHICLE MECHANIC (WHEELED) GROUP 3

SERIAL	SUBJECT	STANDARD	REFERENCE
(a)	(b)	(c)	(d)
10	Recovery	Must be capable of: Efficiently operating medium and heavy breakdown vehicles including - winching, lifting, loading and towing	Maintenance and Operators Manuals applicable to equipments in use

Vehicle Technician General Notes, 1960

HDF 4-5-2-2 (ME)

MEMORANDUM

HQ 3666-1/10 (ME) Vol 2
HQ 3666-1/7 (ME)

1 Feb 60

D ORG

Trade Specifications - Vehicle Trades
Vehicle Artificer
Vehicle Mechanic Tracked
Vehicle Mechanic Wheeled

1. Further to our memorandum of 23 Dec 59 in reply to your memorandum, same file reference, dated 16 Oct 59, Vol 1.

2. It is appreciated that additional combinations could be made to add further plans to the study of this problem of vehicle trades and perhaps it is just coincidence that the transfer of RCASC mechanics to RCEME was tied to Plan B. However, it is more or less an accepted fact that the opportunities for the RCASC mechanics would be greater in RCEME and therefore it is quite likely that this change will be made irrespective of trade designations therefore the transfer to RCEME should be included in all three plans.

3. The following observations are also pertinent:

a. It has not been considered essential that all tracked personnel be completely familiar with all types of heavy equipment including Ferrets, engineer equipment and materials handling equipment. Selected tradesmen who already have trade qualifications, even up to and including Group 4, are given familiarization training as opposed to straight trades training to familiarize them with special types of equipment. This is a continuing problem as new equipments are introduced into the service.

b. The term artificer describes a senior NCO or warrant officer who has a combination of superior trade skills and supervisory ability. The rank designates the individual's position in the military hierarchy; his trade group designates his technical skill. The artificer is defined as a technical non-commissioned officer able to supervise and direct expertly the work of other experts. He receives this designation because he has progressed through the trade groups and ranks to the point where he is very experienced and knowledgeable. It is this acquired knowledge and rank that makes him fit to perform his defined tasks and not the fact that he actually does the physical work of tradesman.

c. Permissive Repair Schedules are not intended to limit repair but are the basis on which numbers of tradesmen are allotted to units, the scale of tooling that is issued and the scale of spares that are held at the various echelons of repair. There is nothing to stop a unit mechanic from doing work beyond that designated in the Permissive Repair Schedule providing time is available and special steps are taken to get necessary tools and spares for the particular job. Furthermore, the practice has been to place the best tradesmen with the forward echelons where the scope of repair is largely governed by the time factor. Forward repair is considered to be preventive maintenance rather than repair in its broader sense.

4. There should be no reason for tradesmen in the lower ranks to think that they can progress into a group four trade without acquiring higher rank. This has never been the case in RCEME and to the best of my knowledge other group trades are the same. One who is capable of qualifying as group four must have more than trade skill to reach this group. Therefore, there must be some tie-in with rank and group four trades qualification.

5. The trade designation has little bearing on this subject of trade structure. Whether the present designations are retained or whether the new designations proposed are used does not particularly matter. The only thing that is really important is that the artificer designation be associated with the upper trade groups and that it is retained.

6. It is agreed that the training of tracked mechanics should be regulated to meet the need. This will be done by selection after the group one course at the School. The method of qualification will in future be by trade test to group three level in both the tracked and wheeled trades.

7. It is difficult to see how a body repairman will get the basic knowledge in handling metals by starting out as a group one welder. A body man must have his skills in welding but his basic skill is that of handling lighter sheet metals. He cannot be expected to graduate as a group one welder and get upgraded to group two body repairman merely by taking in-job training.

8. It is, therefore, recommended that:

a. The transfer of RCASC mechanics to RCEME be accepted.

b. Group four trades be reserved for staff sergeants and up.

c. Vehicle mechanic wheeled and tracked be combined at the group four level into a vehicle artificer.

d. Body repairmen and welders remain separate trades.

e. Trade designations and trade structure remain as is.

(R A Campbell)
Colonel
Director of Electrical and Mechanical Engineering

RAC/4-5049/HD

Vehicle Mechanic (Militia)
Groups 1 & 2, 1960

VEHICLE MECHANIC (MILITIA) GROUPS 1 AND 2

1. CLASSIFICATION

   1.1 Vehicle Mechanic (Militia) Group 1

   1.2 Vehicle Mechanic (Militia) Group 2

2. SUMMARY

   2.1 Inspects, tests, fault finds, adjusts and carries out emergency repairs to wheeled vehicles.

3. DUTIES AND TASKS

   3.1 Inspects and road tests vehicles to check their condition.

   3.2 Recommends work to be carried out by RCEME workshops when equipments require repair beyond the facilities of his unit.

   3.3 Perform basic bench fitting operations such as filing, grinding and drilling, threading & tapping

   3.4 Checks and adjusts various types of mechanical, hydraulic and air brakes.

   3.5 Repacks and adjusts wheel bearings.

   3.6 Completes engine tune-ups by inspecting and adjusting spark plugs, distributor points, ignition timing, ignition wiring and carburetors.

   3.7 Clears plugged fuel lines, changes fuel pumps, and cleans or replaces carburetors.

   3.8 Makes adjustments to steering gear.

   3.9 Instructs drivers in the proper servicing of wheeled vehicles.

   3.10 Uses technical manuals and parts lists as a guide on the repair and maintenance of equipment and the identification and ordering of spare parts.

   3.11 Inspects and adjusts and replaces:

      .1 External engine components.

      .2 Electrical system components.

      .3 Fuel system components.

      .4 Lubrication system components.

      .5 Cooling system components.

      .6 Suspension components.

      .7 Wheels and tires.

(8)

4. TRAINING, EXPERIENCE, SKILLS AND KNOWLEDGE REQUIRED

4.1 The tradesman requires the skills and knowledge described in this specification. The degrees of skill and knowledge will be determined from the references listed. To qualify, he must reach the level shown but not any higher level.

4.2 Normally, the reference material shown below will be used for instructional purposes but other suitable material may be substituted when necessary:

AEM	-	Applicable Equipment Manual.
RSP	-	RCEME School Precis.
TM9-867	-	US Department of the Army Technical Manual TM9-867, Maintenance and Care of Hand Tools, Apr 45. — ? RSP
~~TM9-6140-200-15~~	~~-~~	~~US Department of the Army Technical Manual TM9-6140-200-15, Storage Batteries, Lead Acid Type, Jul 58.~~ No - EME
TM9-2835	-	US Department of the Army Technical Manual, TM9-2835, Lubrication, May 49. no TM9-8000
TM9-8000	-	US Department of the Army Technical Manuals, TM9-8000, Principles of Automotive Vehicles, Jan 56.
TF	-	Training Films.
EMEM	-	Canadian Army Electrical and Mechanical Engineering Manual.
~~IM Sun~~	~~-~~	~~Instructional Manual, Sun, Battery, Starter Tester, Models Y, BST and Y20, 6, 12 and 24 volts.~~
TM9-1825B	-	US Department of the Army Technical Manual, TM9-1825B, Electrical Equipment (Auto-Lite), Nov 52.
TM9-2858	-	US Department of the Army Technical Manuals TM9-2858, Cooling Systems: Vehicles and Powered Ground Equipment, May 45. No - TM9-8000

4.2.1 RCEME School Precis may be ordered through Command EME Channels to AHQ (Attn: DEME).

4.2.2 Technical Manuals will be ordered in accordance with Canadian Army Catalogue of General Staff Training Publications (1959) Section 1, page 1, para 2 b.

4.2.3 Training films and film strips will be requested from Command Film Libraries.

GROUP 1

4.3 To perform his duties satisfactorily, the group 1 tradesman must:

References

GROUP 1 BLOCK 1

4.3.1 Know the following bench fitting and shop practice:

.1 Shop safety precautions including proper use of hand tools, portable power tools and general shop equipments; handling of materials and inflammables.	RSP : 2-1-1 and TM9-867: Secs V, V111, X1, X11, XV, XV111, XX, XX1, XXIV, XXVI, XXV111 and XXIX.
.2 Use of common measuring devices including rules, squares, dividers, inside and outside calipers.	RSP : 2-1-3.
.3 How to read simple mechanical drawings and layout work.	RSP: 5-1-3 Part 1.

4.3.2 Know the use of fastenings and fittings. RSP: 2-2-21/1.

4.3.3 Be able to:

.1 Identify screw thread forms.	RSP: 2-2-4.
.2 Select taps and dies, and carry out simple threading and tapping operations.	RSP: 2-2-6 & 2-2-9 and TM9-867: Sec XXV11.
.3 Carry out simple drilling and grinding operations using twist drills, drill presses, holding devices, portable electric drills and bench grinders.	RSP: 2-1-6, 2-11-1, 2-2-10 and 2-4-1, TM 9-867: Secs 11 & IV.
.4 Select files and be able to carry out basic filing operations.	RSP: 2-2-2 and TM9-867: Sec X1.

4.3.4 Know the methods used for removing broken studs. None.

4.3.5 Know the care and use of the following automotive tools:

.1 Mechanics hand tools contained in Chests Tool Fitters Mk 3.	TM9-867
~~.2 Vehicle shop tools.~~	~~None.~~

4.3.6 Know the basic principles and operation of gasoline and diesel engines and their components, including 2 and 4-stroke cycle engines. TM9-8000: Chaps 3 & 4 and RSP: 6-2-1, 6-2-3 & 6-3-3 and TF 47091.

4.3.7 Know the basic principles, function, location and operation of the cooling system components including pressurized systems. TM9-8000: Chap 7 and TF 47107 and TM9-2858: Chap 2.

	References
4.3.8 Know the ~~basic~~ principles ~~and the~~ of operation of gasoline and diesel fuel supply systems.	TM9-8000: Chaps 5 & 6 and TF 47079.
4.3.9 Obtain 50% of the possible marks on a written examination, and 60% of the possible marks on practical examination on all subjects in Group 1 Block 1.	Militia Trade Test Vehicles Mechanic (Militia) Group 1 Block 1.

4.4 GROUP 1 BLOCK 2

	References
4.4.1 Know the basic principles of DC electricity, Ohm's Law, simple circuits, magnetism, and the function and operation of vehicle electrical system components including:	TM9-8000: Chaps 10 & 11 and RSP: 6-5-6 and TF 47055, 47116, 47117, 47118, 47119, 48130 and 49009.
.1 Instruments and gauges.	
.2 Storage batteries (~~including servicing~~).	~~TM9-6140-200-15: Chap 2.~~ EMEM: Elec: W162 & W163.
.3 Battery and magneto ignition systems.	
.4 Generators and regulators	RSP: 6-5-2/1 & 6-5-3/1.
.5 Starting motors	
.6 Solenoids, switches, lights, horns and wiring harness.	RSP: 6-5-5.
4.4.2 Be able to replace hose connections, thermostats and fan belts.	TM9-8000: paras 89 to 92 and TM9-2858: Chaps 4 & 5.
4.4.3 Be able to test, adjust and replace spark plugs.	None.
revised 4.4.4 Be able to check and replace vehicle lighting circuit components. and adjust headlights.	AEM.
4.4.5 Obtain 50% of the possible marks on a written examination, and 60% of the possible marks on a practical examination on all subjects in Group 1 Block 2.	Militia Trade Test Vehicles Mechanic (Militia) Group 1 Block 2.

4.5 GROUP 1 Block 3

	References
4.5.1 Know the basic principles of operation and function of the power train units including clutches, transfer cases, standard and hydramatic transmissions, differentials, propeller shafts and universal joints, and constant velocity universal joints.	TM9-8000: Chaps 13, 14, 15, 16 & 17 and TF 47002, 47012 & 47014.
4.5.2 Know the basic principles of operation, location and function of components of mechanical, hydraulic and power braking systems.	TM9-8000: Chap 21 and RSP: 6-12-1 and TF 47112, 47053, 47020 and 47054.
4.5.3 Know the basic principles of steering and front end alignment.	TM9-8000: Chap 20 and TF 47110 & 47113.

		Reference
4.5.4	Know the basic principles of operation, location and function of the suspension and running gear including:	TF 47109.
	.1 Suspension systems.	TM9-8000: Chap 18.
	.2 Ball and roller type bearings.	TM9-8000: para 188.
	.3 Types of road wheels.	TM9-8000: paras 244 to 247.
	.4 Front and rear axle assemblies.	TM9-8000: Chaps 16 & 17.
	.5 Frames and body mounting.	TM9-8000: chap 24.
4.5.5	Know maintenance, inspection, care, mounting and dismounting, storage and emergency repairs of tires and tubes.	EMEM: Veh A 761 TM9-8000: Chap 19 Secs 1 & 2.
4.5.6	Be able to replace tires and wheels.	TM9-8000: Chap 19 Secs 1 & 2.
4.5.8	Know the basic principles of operation and be able to service hydramatic transmissions.	TM9-8000: chap 15 Secs 2 & 3 and TF 47049, 47050 and Service Manuals applicable to equipments in use.
4.5.9	Obtain 50% of the possible marks on a written examination and 60% of the possible marks on a practical examination on all subjects in Group 1 Block 3.	Militia Trade Test Vehicle Mechanic (Militia) Group 1 Block 3.

4.6 GROUP 1 BLOCK 4

4.6.1	Know the characteristics of fuels and lubricants including gasoline, diesel fuels, engine oils, heavy gear oils and common grease.	TM9-8000: Chap 8 and RSP: 6-2-2 and 6-29-3 and TM9-2835 Secs 2 & 3.
4.6.2	Know the fundamentals of lubrication, the use of lubricating equipment and lubrication charts, and the correct methods of oil changing and greasing.	TM9-2835: Sec 5 paras 23 to 28 and Sec 2 paras 2 to 11 and Technical manuals applicable to equipments in use.
4.6.3	Be able to carry out seasonal servicing.	AEM and EMEM: A 453 Instr 1.
4.6.4	Be able to use anti-freeze testing equipment.	AEM and TM9-2858: para 53.
4.6.5	Be able to replace, easily accessible minor components including batteries and cables, ~~coolant hoses, fan belts~~, oil and fuel filters and cover gaskets using correct sequence and tools.	AEM.
4.6.6	Obtain 50% of the possible marks on a written examination and 60% of the possible marks on a practical examination on all subjects in Group 1 Block 4.	Militia Trade Test Vehicle Mechanic (Militia) Group 1 Block 4.

Reference (4)

GROUP 2

GROUP 2 BLOCK 1

4.7 In addition to the requirements for group 1, and to perform his duties satisfactorily, the Group 2 tradesmen must:

4.7.1	Be able to adjust clutch and standard transmission linkages.	AEM.
4.7.2	Be able to adjust hydramatic transmission linkage and bands.	AEM.
4.7.3	Be able to clean and adjust hydraulic, power and parking brakes.	AEM.
4.7.4	Be able to replace suspension springs and shock absorbers.	AEM.
4.7.5	Be able to adjust carburetors.	AEM.
4.7.6	Be able to fault find gasoline fuel systems and replace fuel lines, fuel pumps and carburetors.	AEM and RSP 6-8-2 & 6-8-3.
~~4.7.7~~	Obtain 60% of the possible marks on a practical examination on all subjects in Group 2 Block 1.	Militia Trade Test Vehicle Mechanic (Militia) Group 2 Block 1.

4.8 GROUP 2 BLOCK 2

4.8.1	Be able to use simple test equipment, including timing lights, voltmeters, engine ignition analyzer equipment and ~~hydrometers for battery testing~~.	TM9-8000: paras 121 & AEM.
4.8.2	Be able to service, test and charge batteries.	TM9-8000: Chap 10 sec 2 and ~~TM9-6140-200-15: chap 3.~~
4.8.3	Be able to trouble shoot faults in electrical charging circuits and replace generators, voltage and current regulators and cut out relays.	TM9-1825: paras 12 to 14 & 40 to 42.
4.8.4	Be able to test, adjust and repair ignition systems.	TM9-1825B: paras 62 to 67 & 84 and TM9-8000: para 149.
4.8.5	Be able to trouble shoot and replace components in starting systems.	~~1M Gun~~ and TM9-1825B paras 88 to 90.
4.8.6	Be able to make minor adjustments to steering mechanisms.	AEM.
4.8.7	Be able to replace cooling fans, water pumps and radiators.	AEM and TM9-2858.
4.8.8	Obtain 60% of the possible marks on a practical examination on all subjects in Group 2 Block 2.	Militia Trade Test Vehicles Mechanic (Militia) Group 2 Block 2.

(3)

5. RESPONSIBILITY

5.1 The Vehicle Mechanic (Militia) Group 1 and 2 is responsible under general supervision, for trouble shooting, testing, adjusting, repairing or replacing components so as to make emergency repairs to vehicles used in Mobile Support Columns.

6. WORKING CONDITIONS

6.1 Physical

6.1.1 Work in this trade requires considerable physical effort and manual dexterity in the use of tools and handling of parts. Work is usually performed in the open or under a temporary shelter.

6.2 Stresses

6.2.1 Mental stress in this trade is normal.

6.3 Occupational Hazards

6.3.1 Hazards are negligible except for minor cuts, bruises and burns.

7. METHOD OF QUALIFICATION

7.1 Qualification for Group 1

7.1.1 To qualify as a Vehicle Mechanic (Militia) Group 1, the candidate must pass the trade tests for each of the four blocks shown in Group 1.

7.1.2 The scope of the block trade tests will include the requirements of paras 4.3 to 4.6 of this specification.

7.2 Qualification for Group 2

7.2.1 To qualify as a Vehicle Mechanic (Militia) Group 2, the candidate must be qualified as a Vehicle Mechanic (Militia) Group 1.

7.2.2 Qualification may then be obtained by passing trade tests for the two blocks shown in Group 2.

7.2.3 The scope of the block trade tests will include the requirements of paras 4.7 and 4.8 of this specification.

8. CAREER POSSIBILITIES

8.1 Trade Progression

8.1.1 A Vehicle Mechanic (Militia) Group 2 may progress to Vehicle Mechanic (Wheeled) Group 3, providing that he can pass the trade test for this Group 3 CA(R) trade. This would only apply to those with civilian journeyman experience who could act as instructors in this trade.

9. RELATED OCCUPATIONS

9.1 Navy -

9.2 Air Force -

9.3 Civilian - Auto Mechanic

Dictionary of Occupational Titles Code Number

5-81.010

Vehicle Mechanic (Wheeled)
(Militia)
Groups 1 & 2, 1962

FILE NUMBER 1200-T3 VOL. 9

DEPARTMENT OF NATIONAL DEFENCE

ARMY TRADES COMMITTEE

FOR CROSS REFERENCES SEE INSIDE COVER

ROUTING				P.A. AND B.F. ENTRIES				REGISTRY ONLY	
REFERRED	REMARKS	Date of Pass	Initials	Date of P.A.	Initials	Date of B.F.	Cancel B.F.	Date Received	Inspected by
[illegible]	NEW VOL [illegible] MAR 1 8 1963		[illegible]	[illegible]	[illegible]				

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PA

HQ 1200-T3 (MT 2A)

ARMY TRADES COMMITTEE

MINUTES OF THE 174TH MEETING HELD
IN ROOM 3525 "A" BUILDING
AT 1400 HRS ON WEDNESDAY 14 MAR 62

PRESENT

Lt Col	O Potts	[illegible]	(Chairman)
Lt Col	DM Wilson	D Org	
Lt Col	JP Brennan	DSD	
Maj	JC Treleaven	PM	
Maj	B O'Regan	DOS	
Maj	DS Wooles	DST	
Maj	WR Chamberlain	DMC	
Capt	PF Doherty	DEME	
Capt	AH Klassen	DQOP	
Capt	NC Malloch	D Org	

SECRETARY

Maj	NA Robinson	DMT

IN ATTENDANCE

Maj	AC MacDonell	DMT

ITEM 1

1. The minutes of the 173rd meeting were approved.

ITEM 2

2. SERVICE POLICEMAN TRADE GROUPS 1, 2 AND 3

This trade draft specification was approved for submission to ISTC.

ITEM 3

3. MILITIA SERVICE POLICEMAN TRADE GROUPS 1, 2 AND 3

The committee approved the draft specification for submission to ISTC subject to:

a. Change in the implementing instructions.

b. Use of words "serving" and "maintaining" being consistant throughout trade specification.

ITEM 4

4. MILITIA DECONTAMINATOR RCOC TRADE GROUP 1

The committee approved the trade specification for submission to ISTC subject to:

a. Secretarial clearance of the insertion of the old Block 2 specifications in the present blank Block 2.

b. Clarification of 4.3.8 by D Org and RCOC.

..../2

ITEM 5

5. MILITIA RADIAC MECHANIC TRADE GROUPS 1 AND 2

The committee approved the trade specification for submission to ISTC subject to:

a. Deletion of word "adjust" in 3.2.

ITEM 6

6. MILITIA RECOVERY MECHANIC TRADE GROUPS 1 AND 2

The committee approved the trade specifications for submission to ISTC subjec to:

a. 4.4 reading "Group 2 Block 2".

ITEM 7

7. MILITIA VEHICLE MECHANIC WHEELED TRADE GROUPS 1 AND 2

The committee approved the trade specifications for submission to ISTC subject to:

a. Deletion of second sentence in 2.1.

ITEM 8

8. MILITIA WELDER TRADE GROUPS 1 AND 2

The committee approved the trade specifications for submission to ISTC.

ITEM 9

9. MILITIA ELECTRICAL MECHANIC TRADE GROUPS 1 AND 2

The committee approved the trade specifications for submission to ISTC subject to:

a. Deletion of word "Mobile" in 2.1, 3.6 and 5.2 and insertion of word "National".

for (MA Robinson)
Major
Secretary

Issued: 19 Mar 62

Distribution:

DSD
D Org
DQOP
DST
DOS
DEMS
PM
DMC
DEMT

ARMY TRADE SPECIFICATION

Date typed: 31 Jan 62

MILITIA VEHICLE MECHANIC WHEELED GROUPS 1 AND 2

1. GENERAL INFORMATION

1.1 Classification

1.1.1 Full Title — Abbreviation

Militia Vehicle Mechanic Wheeled — Militia Veh Mech Wh

1.1.2 This trade consists of two trade groups, each group containing two blocks.

1.2 Selection Requirements

1.2.1 This trade is found in Militia units only. Candidates must be members of The Royal Canadian Army Service Corps or The Corps of Royal Canadian Electrical and Mechanical Engineers or be willing to, and acceptable for, transfer to one of these corps.

1.2.2 Minimum "M" score and educational level: .... and Grade....

1.2.3 PULHEMS Profile:

Battle — Support — Base

2. SUMMARY

2.1 In National Survival Operations, carries out emergency repairs to wheeled vehicles. ~~In peace time training, serves as a unit vehicle mechanic.~~

3. DUTIES AND TASKS

3.1 Performs bench fitting operations such as cutting, drilling, grinding, bending and straightening metal.

3.2 Completes engine tune-up by performing such duties as inspecting, cleaning and adjusting spark plugs and distributor points, adjusting ignition timing and inspecting and replacing ignition wiring.

3.3 Carries out fault-finding drills and removes and replaces component parts in the cooling, electrical, fuel and lubricating systems.

3.4 Carries out fault-finding drills and adjusts, removes and replaces component parts in the braking, steering and suspension systems.

3.5 Services batteries, tires and tubes.

3.6 Carries out seasonal servicing to wheeled vehicles.

3.7 Uses technical manuals and parts list as a guide.

3.8 May be required, when employed in NCASC, to operate and service the recovery vehicle of his unit and extricate vehicle casualties.

.../2

TRAINING, EXPERIENCE, SKILLS AND KNOWLEDGE REQUIRED

4.1 Training Blocks

4.1.1 The tradesman requires the skills and knowledge described in this specification. The degree of skill and knowledge will be determined from the references listed for each block.

4.1.2 To qualify in a particular block he must reach the level shown but not any higher level. Each block has been so designed that it can be achieved in approximately 60 periods of instruction.

4.1.3 On successful completion of each block, the candidate will be granted partial trades qualification and awarded a cash bonus (QR (Army) 210.04).

4.1.4 To qualify in a particular trade group, he must qualify in both blocks.

4.2 Training Material

4.2.1 Only the publications shown below will be used as reference material:

AEM - Applicable Equipment Manual.
COC - Canadian Ordnance Catalogue.
CTS - Department of the Army Technical Manual - TM 9-8024 - 2½-ton 6 x 6 Cargo Truck M135 - Oct 55.
EME - Canadian Army Electrical and Mechanical Engineering Manual.
HMT - Department of the Army Technical Manual - TM 9-243 - Use and care of Hand Tools and Measuring Tools - Sep 60.
MTO - Machine Tool Operation - Part 1 by Burghardt, Axelrod and Anderson - Fifth Edition.
OMT - Department of the Army Technical Manual - TM 9-242 - Fundamentals of Ordnance Corps Machine Tools - Feb 59.
PAV - Department of the Army Technical Manual - TM 9-8000 - Principles of Automotive Vehicles - Jan 56.
RSP - RCEME School Precis (available from AHQ DEME).
SAF - Safety Manual for Government Departments and Crown Agencies - Department of Labour, Canada - 1958.

4.2.2 In addition to the reference material shown above, the following training films will be found useful for instructional purposes but will not be used to determine the degree of skill and knowledge required.

CANADIAN ARMY TRAINING FILMS

47002 Synchromesh transmissions - Principles of Operation.
47010 Tyre sense - Use of the repair set.
47053 Hydraulic Brakes - Principles of Operation.
47056 Internal Combustion Engine - Principles of Operation.
47069 Lubrication of Military Vehicles - Pt 1 Principles of Lubrication.
47070 Lubrication of Military Vehicles Pt 2 Methods of Lubrication.

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47090	Fuel pump - Principles of Operation.
47098	Care and use of hand tools.
47104 to 47115	Automotive Trouble Shooting Parts 1, 2, 6, 9, 10, 11B, 11C, 12 to 15 & 17.
47133	Automotive Trouble Shooting Pt 4 Sealed Electrical Systems.

GROUP 1 - BLOCK 1

4.3 To perform his duties satisfactorily, the Group 1 Block 1 tradesman must:

		References
4.3.1	Know the safety precautions in a workshop in general and those applicable to the vehicle section in particular.	RSP: no 6-1-4 and SAF: chaps 6, 8 to 14 & pp 69 & 70 and EME: Stat Ops V101 & V300.
4.3.2	Be able to use and care for:	
	.1 Common vehicle hand tools.	HMT: paras 89 to 116, 172, 173b, c & d, 174b, 178 to 181 & 192 to 195.
	.2 Feeler gauges, outside calipers and micrometers.	HMT: paras 39 to 48 & 70.
	.3 Drill presses, portable electric drills, pedestal and bench grinders.	OMT: paras 19, 20, 24 to 30, 41 to 44, 48 to 52, 212 & 215.
4.3.3	Be able to:	
	.1 Sharpen drills, chisels, punches and screwdrivers.	HMT: paras 99, 174 & 175 and OMT: para 21.
	.2 Remove broken studs.	HMT: paras 235 to 239.
	.3 Solder, using soldering irons and blow torches.	HMT: paras 126 to 130 & 144 to 146.
	.4 Bend and shape cold metal.	RSP: no 2-2-15.
	.5 Cut, flare and fit copper and steel tubing.	HMT: paras 216 to 218.
4.3.4	Be able to recognize the common thread forms and to thread using taps and dies.	MTO: pp 417 to 421, 424 & 431 and HMT: paras 223 to 230.
4.3.5	Know the types of standard hardware, commonly known as "expendable stores", used in the construction and repair of vehicles.	RSP: no 2-2-21/1 and COC: sec 1 G.
4.3.6	Know the types of tires and rims used on service vehicles and the cause of irregular tire wear.	EME: Veh A761 secs 1 to 4 & Veh A762 paras 1 & 2.
4.3.7	Be able to mount and demount tires and repair tubes.	EME: Veh A761 secs 5 & 8 & Veh A762 paras 3 to 7.

4.3.8	Be able to recognize gasoline, diesel fuel, engine oils, gear oils and greases and know where and why each is used in service vehicles.	EME: Veh A124 and PAV: paras 46 to 49 & 100.
4.3.9	Be able to lubricate a vehicle (including inspecting, repacking and adjusting front wheel bearings) and carry out seasonal servicing.	EME: A123 & A453 Instr 1 and AEM.
4.3.10	Know the principles of operation of gasoline engines and the function of their components as follows:	
	.1 Engine construction and operation.	PAV: paras 7, 8 & 10.
	.2 Engine types and measurements.	PAV: paras 9, 10, 12 & 13.
	.3 Classification of engines.	PAV: paras 14 & 15.
	.4 Cylinders, cylinder blocks and heads.	PAV: paras 17, 18 & 20.
	.5 Pistons, piston rings and pins.	PAV: paras 23 to 25.
	.6 Crankshafts and connecting rods.	PAV: paras 21, 26, 27, 29 & 30.
	.7 Valves and valve mechanisms.	PAV: paras 31 & 32.

GROUP 1 - BLOCK 2

4.4 To perform his duties satisfactorily, the Group 1 Block 2 tradesman must:

		References
4.4.1	Know the principles of operation of gasoline engine fuel systems and the function of their components as follows:	PAV: paras 37 & 38.
	.1 Principles of carburetors.	PAV: paras 39 to 45 & 59 to 70.
	.2 Fuel tanks.	PAV: para 50.
	.3 Fuel filters and pumps.	PAV: paras 51 & 52.
	.4 Air cleaners.	PAV: para 53.
	.5 Intake and exhaust systems.	PAV: paras 54 to 57.
4.4.2	Know the principles of operation of gasoline engine cooling systems and the function of their components as follows:	PAV: paras 83 to 86.

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	.1 Water jackets.	PAV: para 87.
	.2 Radiators.	PAV: paras 88, 92 & 93.
	.3 Fans and shrouds.	PAV: para 90.
	.4 Thermostats.	PAV: para 91.
	.5 Water pumps.	PAV: para 89.
4.4.3	Know the principles of operation of gasoline engine lubricating systems and the function of their components as follows:	PAV: para 99.
	.1 Types of lubricating systems.	PAV: para 107.
	.2 Oil cleaners.	PAV: paras 102 to 104.
	.3 Crankcase vents.	PAV: para 105.
	.4 Oil pumps.	PAV: para 101.
4.4.4	Know the principles of operation of the automotive ignition and electrical systems and the function of their components as follows:	PAV: paras 110 to 119.
	.1 Lead-acid storage batteries.	PAV: paras 120 to 123 and EME: Elect W 162.
	.2 Automotive generators.	PAV: paras 124 to 131.
	.3 Automotive regulators.	PAV: paras 132 to 134.
	.4 Starters.	PAV: paras 140 to 142.
	.5 Battery ignition systems.	PAV: paras 145 to 150.
	.6 Lighting systems.	PAV: paras 160 to 170.
4.4.5	Know the principles of operation and the function of automotive instruments, gauges and accessories.	PAV: paras 171 to 178.
4.4.6	Be able to:	
	.1 Remove, test, replace and service lead-acid type storage batteries.	EME: Elect W163, W164 paras 3 to 16 & 169 instr 1 & 2.
	.2 Remove and replace coolant hoses and thermostats.	AEM.
	.3 Remove, clean and replace air, oil and fuel cleaners.	AEM.
	.4 Remove and replace starting motors, generators, regulators, fuel pumps and carbureters.	AEM.
	.5 Flush and clean cooling systems and remove and replace radiators.	AEM.

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.6	Time engines and remove, clean, adjust and replace distributor points and spark plugs.	AEM.
.7	Remove and replace light bulbs and remove, replace and adjust fan belts and sealed-beam lamp units.	AEM.

GROUP 2 - BLOCK 1

4.5 In addition to the requirements for Group 1, and to perform his duties satisfactorily, the group 2 block 1 tradesman must:

		References
4.5.1	Know the principles of operation of the automotive suspension systems and the function of their components.	PAV: paras 233 to 240.
4.5.2	Know the principles of operation of the automotive steering systems and the function of their components.	PAV: paras 259 to 268.
4.5.3	Be able to carry out wheel alignment.	PAV: paras 272 to 277.
4.5.4	Know the principles of operation of the automotive braking systems and the function of their components as follows:	PAV: paras 278 to 282.
	.1 Mechanisms.	PAV: paras 283 to 292.
	.2 Mechanical systems.	PAV: paras 293 to 295.
	.3 Handbrake systems.	PAV: para 301.
	.4 Hydraulic systems.	PAV: paras 296 to 302.
	.5 Air-hydraulic systems.	PAV: para 306.
4.5.5	Know the principles of operation of the automotive power trains and the function of their components as follows:	PAV: paras 186 to 189.
	.1 Clutches.	PAV: paras 191 to 194.
	.2 Standard transmissions.	PAV: paras 199 to 201.
	.3 Hydramatic transmissions.	PAV: paras 203 & 204.
	.4 Transfer assemblies.	PAV: paras 209 & 210.
	.5 Propeller shafts.	PAV: paras 214 to 216.
	.6 Differentials.	PAV: paras 217 to 220.
	.7 Final drive and driving axles.	PAV: paras 222 to 227.

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4.5.6 Be able to remove and replace:

.1	Shock absorbers, springs and spring shackles.	AEM.
.2	Steering system components.	AEM.
.3	Brake shoes, wheel and master cylinders.	AEM.
.4	Tail pipes, exhaust pipes and mufflers.	AEM.

4.5.7 Be able to:

.1	Inspect, remove and replace front wheel oil and grease seals.	AEM.
.2	Adjust mechanical and hydraulic brakes and locate faulty components.	AEM.

GROUP 2 - BLOCK 2

4.6 To perform his duties satisfactorily, the Group 2 Block 2 tradesman must:

		References
4.6.1	Be able to locate faulty components in and make adjustments to:	
.1	Ignition systems.	AEM.
.2	Electrical systems.	AEM.
.3	Lubricating systems.	AEM.
.4	Cooling systems.	AEM.
.5	Fuel systems.	AEM.
.6	Steering systems.	AEM.
.7	Suspension systems.	AEM.
.8	Drive lines.	AEM.
4.6.2	Be able to adjust:	
.1	Carburetors.	AEM.
.2	Clutches and standard transmission linkage.	
.3	Front band and throttle linkage in hydramatic transmissions.	CTS: paras 301 & 302.
4.6.3	Be able to remove and replace instrument gauges, heaters and accessories.	AEM.

RESPONSIBILITY

5.1 The Militia Vehicle Mechanic Wheeled Group 1 is responsible, under direct supervision, for making emergency repairs to vehicles in Mobile Survival Columns by replacing component parts.

5.2 The group 2 tradesman is responsible, under general supervision, for locating, removing and replacing faulty components in vehicles of Mobile Survival Columns.

6. WORKING CONDITIONS

6.1 Physical

6.1.1 Work in this trade requires considerable physical effort and manual dexterity in the use of tools and the handling of parts. Work is usually performed in the open or under temporary shelter.

6.2 Stresses

6.2.1 Mental stress is normal.

6.3 Occupational Hazards

6.3.1 Hazards are negligible except for minor cuts, bruises and burns.

7. METHOD OF QUALIFICATION

7.1 Qualification for Group 1

7.1.1 To qualify as a Militia Vehicle Mechanic Wheeled Group 1, the candidate must be in possession of DND permit 404.

7.1.2 Qualification may then be obtained by passing two Block trade tests authorized by Army Headquarters.

7.1.3 The scope of the Block trade tests will include the respective requirements of paragraphs 4.3 and 4.4 of this specification.

7.2 Qualification for Group 2

7.2.1 To qualify as a Militia Vehicle Mechanic Wheeled Group 2, the candidate must be qualified as a Militia Vehicle Mechanic Wheeled Group 1.

7.2.2 Qualification may then be obtained by passing two Block trade tests authorized by Army Headquarters.

7.2.3 The scope of the Block trade tests will include the respective requirements of paragraphs 4.5 and 4.6 of this specification.

8. CAREER POSSIBILITIES

8.1 This trade does not progress to any other trade.

RELATED OCCUPATIONS

9.1 Navy - None

9.2 Air Force - None

			Dictionary of Occupational Titles Code Number
9.3	Civilian	- Automotile Mechanic (Auto Ser)	5-81-010
		Truck Mechanic (Auto Ser)	5-81-030
		Automobile - Repair Serviceman (Auto Ser)	5-81-910
		Automobile - Accessories Installer (Auto Ser)	7-83-981

10. IMPLEMENTING INSTRUCTIONS

10.1 Militia Qualification

10.1.1 This specification replaces the provisional Training Standard for Vehicle Mechanic Group 1 (Militia) contained in the Provisional Instruction on Training for the Militia.

10.1.2 It will be seen that the skills and knowledge have been completely rearranged. Therefore, anyone who has commenced Militia Vehicle Mechanic training in accordance with the block Standards referred to in paragraph 10.1.1 above, will be granted qualification as follows:

.1 Those who have completed training in blocks 1 or 2 of said standard will be granted group one qualification when they pass the block trade tests for group one based on this new specification.

.2 Those who have completed training and passed the tests in block 3 of said standard will be granted group one qualification without retesting.

.3 Those who have completed training in blocks 4 or 5 of said standard will be granted group one qualification without retesting and group two qualification when they pass the block trade tests for group two based on this new specification.

10.2 Entitlement to Militia Group Pay

10.2.1 Militia personnel qualified as Militia Vehicle Mechanics Wheeled (whether they qualified in accordance with the provisional training standard or this new specification) and covering an establishment position for the corresponding Regular Force trade of Vehicle Mechanic Wheeled may draw group pay as Militia Vehicle Mechanic Wheeled (CAMTS 6.3.2.1).

10.2.2 Notwithstanding the requirement to cover an appropriate establishment position, those who qualified as in 10.2.1 before 13 Jun 61 may draw group one pay irrespective of establishment position.

10.3 Regular Force Qualification and Group Pay

10.3.1 Former Regular Army personnel qualified in the corresponding Regular Force trade of Vehicle Mechanic Wheeled in accordance with CAMTS 4.6.3 and covering an establishment position for the trade may draw their Regular Force group pay (CAMTS 6.3.2.2).

10.3.2 Notwithstanding the fact that the provisions of CAMTS 4.6.3 and 6.3.2.2 are not retroactive beyond 1 Sep 61, personnel who were in the Militia and drawing Regular Force group pay on 31 Aug 61 may continue to draw it.

Vehicle Trades Specification Rewrite, 1962

ARMY TRADES COMMITTEE

MINUTES OF THE 175th MEETING HELD IN ROOM 3526 "A" BUILDING AT 1400 HRS ON MON 17 SEP 62

PRESENT

Lt Col DH Cunningham - DDMT (Chairman)
Lt Col DM Wilson - D Org
Lt Col JP Brennan - DMCM
Capt JJA Doucet - D Arty
Capt FF Doherty - DEME
Capt AH Klassen - DQOP
Capt TL Williams - D Org

SECRETARY

Capt VA Thompson - DMT

ITEM 1

1. The minutes of the 174th Meeting were approved.

ITEMS 2 - 4 incl

VEHICLE MECHANIC TRACKED GROUPS 1, 2 AND 3
VEHICLE MECHANIC WHEELED GROUPS 1, 2 AND 3
MASTER VEHICLE TECHNICIAN GROUP 4

2. The Committee approved the draft specifications in principle subject to:

a. D Org and DEME to re-examine and rewrite in more detail.

b. Complete financial implications as listed in paragraph 9 of the Supporting Data to be supplied the Committee by DEME.

c. Items to be continued on the Agenda in the meantime.

ITEMS 5 - 7

SURVEYOR RCA GROUPS 1, 2 AND 3
SURVEYOR RCA RADAR GROUPS 2 AND 3
SURVEYOR RCA SOUND RANGING GROUPS 2 AND 3

3. The Committee approved the above trade specifications for submission to ISTC.

NEW ITEMS

4. The following trade specifications were approved secretarially for submission to ISTC on the dates noted:

a. Militia Decontaminator RCOC trade Group 1 Block 1 - 27 Mar 62.

b. Master Technicians - RCEME in the following trades: Aircraft, Communications Systems, Electrical, Fire Control Systems, Instrument, Radar, Radio, Vehicle and Weapons - 13 Jul 62.

c. Militia Decontaminator RCOC Group 1 Block 2 - 29 Aug 62.

2A

MEMORANDUM

HQ 1200-T3 (Org 2B)

7 Sep 62

(1)

The Chairman
Army Trades Committee (through DEME)

Agenda
Vehicle Trades

1. Telecon Major Blais - Capt Malloch this date refers ATC consideration of specifications for the vehicle trades on 17 Sep 62.

2. It is customary, before draft trade specifications are submitted to ATC, for D Org to have them approved by the Corps Director concerned. In the case of the vehicle trades:

a. The trades were studied in the field and very detailed draft specifications prepared.

b. These drafts were edited in D Org and a great deal of the detail struck out - over the objections of the DEME rep working with D Org.

c. By reason of the urgency of getting authority to conduct training, the DEME rep approved the specifications which have now been reproduced and sent for ATC consideration.

d. The RCEME School having seen the drafts now advises that the deletion of detail has been so drastic that the specifications are no longer adequate for detailed course planning.

3. The specifications should not be approved for ISTC and for printing if they are not adequate. On the other hand, it is not desireable to withdraw them from the Agenda since they serve to back up DEME's earlier requests for DMT approval of changes in courses.

4. It is requested:

a. that the specifications be approved in principle as planning specs;

b. that D Org and DEME be permitted to re-examine the drafts and submit to ATC, as soon as possible, specifications unchanged in duties and in skill and knowledge content but of sufficient detail to serve the purposes intended.

(2) ATC

1. Since we plan to commence Gp 1 Courses, on the new specs, in Jan 63, it is imperative that the specs be approved in principle.

NCM/4-9188

for DEME
10 Sep 62

for (TJ Green)
Colonel
Director of Organization

(3) Noted. For 17 Sep meeting
Blais
MTJA
11 Sep 62

ANNEX "A" to
HQ 1200-3 (Org 2B)
Dated 27 Aug 62

SUPPORTING DATA

FOR

ARMY TRADES COMMITTEE

ON

VEHICLE TRADES

Vehicle Mechanic Wheeled Groups 1, 2 and 3
Vehicle Mechanic Tracked Groups 1, 2 and 3

1. These are the rewritten trade specifications for the existing trades of the same name and groups.

2. They are rewritten in the new form to spell out the skills and knowledge in more detail and to show the training references.

3. Although there is a great difference in the physical appearance of the specification there is, in fact, little difference in the duties and tasks performed or the skills and knowledge required. Such differences are shown in detail in paragraph 10 of each specification.

4. The differences in method of qualification are detailed on page 3 of this paper.

Master Vehicle Technician Group 4

5. This is the rewritten trade specification for the existing trade of Vehicle Artificer Group 4 (renamed by Army Trades Committee in Jul 62 as Master Vehicle Technician Group 4).

6. It differs from the previous trade as follows:

a. The deletion of the management and supervisory functions - and therefore the deletion of the NCO prerequisite to qualification;

b. The deletion of the requirement to do machining and welding, brazing and blacksmithing;

c. The deletion of voice procedure;

d. The addition of repairs to the Bobcat;

e. The addition of preservation storage and shipping procedures;

f. The addition of the inspection, repair and adjustment of materials handling equipment and a variety of mobile engineer equipment and shop tools and equipment.

7. The differences in prerequisites and in the method of qualification are detailed on page 3 of this paper.

.../2

8. The trade is now classed for group pay purposes as a group 4 trade. It will be evaluated by D Org (together with others now being prepared for submission to ATC) to determine where the trade, as described in the new specification, fits into the current list of Army trades.

GENERAL

9. DEME is asked to advise the committee whether there are any financial implications arising from:

a. Increase in number of tradesmen;

b. Upgrading of tradesmen;

c. Cost of any additional instructors; — 15%

d. Cost of any additional training facilities, equipment or reference material;

e. Any other related costs;

f. Any demonstrable saving.

10. DSD rep is asked to approve the abbreviation "Mr Veh Techn".

RECOMMENDATION

11. All three trade specifications are recommended for the approval of Army Trades Committee and submission to the Inter-Service Trades Committee.

METHODS OF QUALIFICATION IN THE VEHICLE TRADES

	PRESENT	PROPOSED
GROUP 1	One course for all vehicle mechanic candidates.	Separate courses for tracked candidates and wheeled candidates - although much of the training is common.
GROUP 2	Two trade tests - one for wheeled and one for tracked.	No change.
GROUP 3	Wheeled - pass a trade test. Tracked - pass a course.	Both tracked and wheeled candidates certified by their commanding officers as proficient in certain in-job functions and then attend separate courses to complete their qualifications.
GROUP 4	a. Be a group 3 mechanic. b. Hold the substantive rank of cpl. c. Corps policy restricted group pay to Ssgts and WOs. d. Pass a pre-group assessment. e. Obtain dual qualification by passing the group 3 wheeled trade test or the group 3 tracked course. f. Pass a group 4 qualifying course.	a. No change. b. No rank prerequisite. c. No corps restriction. d. No change. e. Pass one of two courses (depending on his basic trade). The first part of each course gives him the essentials of the other trade and the second part is the group 4 qualifying portion common to both types of candidate. f. (See above).

Vehicle Mechanic (Tracked)
Groups 1 & 2 & 3, 1963

Vehicle Mechanic Tracked Groups 1, 2 and 3

Army Trade Specification V.03

1. General Information

1.1. Classification

Full Title	Abbreviation	Code Number
Vehicle Mechanic Tracked	Veh Mech T	Group 1 7811
		Group 2 7812
		Group 3 7813

1.2. Selection Requirements

1.2.1. Candidates must be members of The Corps of Royal Canadian Electrical and Mechanical Engineers or be willing to, and acceptable for, transfer to that corps.

1.3. Minimum “M” score and educational level: 130 and Grade 8.

1.4. PULHEMS Profile

Battle	Support	Base
2233312	2233313	3334314

2. Summary

2.1. Finds faults in and tests, adjusts and repairs mobile engineer equipment and armoured fighting vehicles (AFVs) (excluding the armament and gun control system and repairs on the Centurion main engine). Recovers vehicle casualties.

3. Duties and Tasks

3.1. Performs bench fitting operations such as filing, grinding, pressing, reaming and threading.

3.2. Checks, tests, adjusts and repairs ignition, generator and electrical starting systems on AFVs and mobile engineer equipment using electrical test equipment.

3.3. Checks engine condition and finds faults by taking compression and vacuum readings and by sight and sound.

3.4. Strips, repairs and reassembles fuel pumps, carburetors, diesel fuel injectors, water pumps and distributors.

3.5. Removes, repairs, replaces and adjusts certain assemblies on Centurion main engines and most components on other IC engines of AFVs and mobile engineer equipment.

3.6. Removes, repairs, replaces and adjusts most components on diesel engines of AFVs and mobile engineer equipment.

3.7. Removes, replaces and adjusts transmissions, clutches and transfer cases.

3.8. Removes, repairs and replaces power train assemblies.

3.9. Checks, repairs and adjusts braking and steering systems.

3.10. Repairs and adjusts tracks and track suspensions.

3.11. Replaces and adjusts wheel bearings and road, idler and support wheels on tanks and mobile engineer equipment.

3.12. Repairs and adjusts wheel drive assemblies on Ferret scout cars.

3.13. Road tests AFVs to determine and locate faults and to ensure repairs have been completed satisfactorily.

3.14. Operates an armoured recovery vehicle (ARV).

3.15. Uses oxyacetylene welding equipment for cutting and to make emergency repairs during recovery operations.

3.16. Lubricates AFVs and engineer equipment and does seasonal servicing.

3.17. Instructs junior tradesmen in the performance of their duties.

4. Training, Experience, Skills and Knowledge Required

4.1. The tradesman requires the skills and knowledge described in this specification. The degrees of skill and knowledge will be determined from the references listed for each trade group. To qualify in a particular group, he must reach the level shown but not any higher level.

4.2. Only the publications shown below will be used as reference material.

AEE - Automotive Electrical Equipment by W. H. Crouse - 4th Edition - 1959.

AEM - Applicable equipment manual.

AFB - United States Technical Manual, TM 9-214 - Anti-Friction Bearings - Nov 59.

ARV - NATO stock no 7610-21-111-8034 (WO Code no 12234) - User Handbook for Tank, ARV, Centurion Mk 2 - 1958.

BIA - NATO stock no 7610-21-102-2614 - Bendix Ignition Analyzer.

CAT - Serviceman's Reference Book for Caterpillar Diesel Engines (4-¼-inch Bore 6-cylinder) - Form 30519.

CBL - NATO stock no 7610-21-102-1279 Broomwade Spares and Maintenance Manual - Publication 115 - WR 280M - Rotary Compressor with Chrysler Petrol Engine.

CCS - NATO stock no 7610-21-102-2501 - Centurion Crew Servicing Pamphlet-Canadian - 1958.

CDE - Cummins Shop Manual - Unit Rebuilding - Diesel Engines - Bulletin 983358-A.

COC - Canadian Ordnance Catalogue.

CSA - Mechanical Engineering Drawing Standards - B78.1 - 1954 by Canadian Standards Association.

CSM - Cummins Shop Manual, PT Fuel System, Bulletin 983334-D.

CTH - WO Code no 1899 - Centurion Technical Handbook - May 1950.

CUH - NATO stock no 7610-21-102-2048 (WO Code no 10538) - Centurion User Handbook.

DFT - United States Technical Manual, TM 5-230, General Drafting - Oct 62.

EME - Canadian Army Electrical and Mechanical Engineering Manual.

ENG - Automotive Engines by W. H. Crouse - 2nd Edition - 1959.

FLC - Automotive Fuel, Lubricating and Cooling Systems by W. H. Crouse - 2nd Edition - 1959.

GMB - General Mathematics - Book 1 by Jackson, Dean and Crawford - 1942.

GMD - General Motors Diesel - Series 71 - Maintenance and Overhaul Manual - Form 6SE-102 - Sep 55.

GME - United States Technical Manual, TM 9-8025-1 - GMC Model 302 Engine - May 58.

HMT - United States Technical Manual, TM 9-243 - Use and Care of Hand Tools and Measuring Tools - Sep 60.

HSD - High Speed Diesels by P. M. Heldt.

IDP - WO Code no 9512 - Instructor's Driving Pamphlet - Centurion - 1958.

IHB - Serviceman's Field Reference - International Harvester Co. - Form 1SS-1012.

IHC - Service Manual - International Crawler Tractors - Form 1SS-1014.

IHD - Service Manual - International Power Units - Form CHS-175.

IRH - Handbook of the Air Compressor - Trailer Type - Ingersoll-Rand Model 105-A-1942.

LOM - Thew-Lorain Operation Manual - The Thew Shovel Co. - Lorain Power Shovel - Class 1 and 2 series.

MMA - Maintenance Manual for Adams Motor Grader 550.

MTO - Machine Tool Operation by Burghardt, Axelrod and Anderson - Part 1 - 5th Edition - 1959.

OMC - Operation and Maintenance - Cummins Diesel Engines - Bulletin no 983373-B.

OMI - Operation and Maintenance Instruction, D6 Tractor, Form 12892-9.

OMT - United States Technical Manual, TM 9-242 - Fundamentals of

Ordnance Corps Machine Tools - Feb 59.

OOM - NATO stock no 7610-21-102-1975 (TM 9-8028) - 5-Ton 6X6 Cargo Truck - Jun 55.

PAV - United States Technical Manual, TM 9-8000 - Principles of Automotive Vehicles - Jan 56.

RBC - Serviceman's Reference Book - Caterpillar Diesel Engines - Form 30238-3.

REC - Canadian Army Manual of Training, CAMT 11-4 - Recovery - 1962.

RMD - Canadian Army EME Manual - Veh D114 - Repair Manual - Truck 3/4-ton Dodge.

RSG - United States Technical Manual, TM 9-8615 - Steering Gears (Ross Gear and Tool Co.) - Jun 1953.

RSP - RCEME School Precis.

SAF - Safety Manual for Government Departments and Crown Agencies - Dept of Labour, Canada - 1958.

SCF - British EMER - Wheeled Vehicles V622 - Scout Car, Ferret - Technical Handbook - Aug. 57.

SPK - United States Technical Manual, TM 9-8638 - Spark Plugs used on Ordnance Material - Dec 56.

SRB - Serviceman's Reference Book - Caterpillar D6 Tractor - Form 30027-3.

STC - Canadian Army Manual for RCASC Supplies, Transport and Services.

TCC - Canadian Army EME Manual - Veh J282 - Tank Centurion Canadian.

TSD - Workshop Manual for "B" Range Petrol Engines - TSD Publication 702.

WTA - United States Technical Manual, TM 9-237 - Welding, Theory and Application - Oct 58.

Group 1

4.3. To perform his duties satisfactorily, the group 1 tradesman must:

4.3.1	Know the safety precautions for workshops and in particular, those applicable to the vehicle sections.	RSP: no 6-1-4 and SAF: chaps 6 & 8 to 14 and EME: Man V101 & Man V300.
4.3.2	Be able to use and care for:	
4.3.2.1	Feeler gauges, squares, calipers and micrometers.	HMT: paras 34 to 48, 69 to 73 & 78 to 81.

4.3.2.2	Common vehicle mechanic hand tools.	ENG: paras 254 to 264 & 272 to 274.
4.3.2.3	Drill presses, portable electric drills, twist drills and pedestal grinders.	OMT: paras 18 to 21, 24 to 34, 41 to 44, 48 to 51, 212 & 215.
4.3.3	Be able to:	
4.3.3.1	Solder - using soldering irons and blow torches.	HMT: paras 126 to 130 & 143 to 146.
4.3.3.2	Cut, flare and fit copper and steel tubing.	HMT: paras 216 to 218.
4.3.3.3	Ream to .002-inch tolerance.	HMT: paras 219 to 222.
4.3.3.4	Remove broken studs.	HMT: paras 235 to 239.
4.3.3.5	Bend and shape cold metal.	RSP: no 2-2-15.
4.3.4	Know the common thread forms and be able to use and care for taps and dies.	HMT: paras 223 to 234.
4.3.5	Know the types of standard hardware, commonly known as “expendable stores”, used in the construction and repair of vehicles.	RSP: no 2-2-21/1 and COC.
4.3.6	Be able to add, subtract, multiply and divide whole numbers, fractions and decimals, to calculate percentages and to use simple algebraic formulae.	GMB: pp 8 to 14, 27 to 87 & 145 to 147.
4.3.7	Be able to read simple mechanical drawings.	DFT: paras 46, 48, 124, 130, 132 to 135, 146, 155, 156, 170, 171, 180, 181a, 182a, 191, 193, 194, 301b, 302a, 303, 304, 311 & 313c and CSA: paras 6.1 & 6.2.
4.3.8	Understand the fundamental principles of fluid and air pressures, vacuum, gravity, work, energy, power, motion, heat and friction and their application.	ENG: paras 1 to 18 & 23 to 28 and ACB: paras 1 to 26.
4.3.9	Know the basic characteristics and uses of metals in common use and be able to indentify them.	WTA: paras 24 to 28.

4.3.10	Know the construction and operating principles of gasoline engines and the functions of their components as follows:	
4.3.10.1	Cylinder and valve arrangements, engine performance measurements and engine types.	ENG: paras 49 to 54 & 64 to 86.
4.3.10.2	Cylinder block and cylinder head construction.	ENG: paras 90 to 93.
4.3.10.3	Engine gaskets.	ENG: para 94.
4.3.10.4	Exhaust and induction systems and manifold heat controls.	ENG: paras 96 to 99 and GME: para 102 and CTS: para 135.
4.3.10.5	Crankshafts, crankshaft bearings, connecting rods, pistons and piston rings.	ENG: paras 100 to 106, 110 to 120 & 223.
4.3.10.6	Cams, camshafts, valves, valve trains and hydraulic valve lifters.	ENG: paras 121 to 133.
4.3.10.7	Engine lubrication and lubrication systems.	ENG: paras 96 & 161 to 167 and FLC: paras 200 to 208 and PAV: paras 105 & 106.
4.3.10.8	Special features of the Centurion engine.	TCC: Instr 1.
4.3.11	Know the construction and operating principles of gasoline engine fuel systems and the function of the tanks, filters, screens, gauges, pumps, air cleaners and carburetors.	FLC: paras 36 to 48, 52 to 55 & 57 to 71 and TCC: Instr 1 paras 126 to 128.
4.3.12	Know the basic types and uses of fuels and lubricants used in AFVs and mobile engineer equipment and be able to locate specific information concerning them.	STC: vol 4 para 59.02 & anx 4H and FLC: paras 100 to 120 & 210 to 216.
4.3.13	Know the operating principles of the engine cooling systems and the functions of the follow- components:	
4.3.13.1	Water jackets and pumps.	FLC: paras 237 to 241.
4.3.13.2	Engine fans and radiators.	FLC: paras 242 & 243.
4.3.13.3	Hot water heaters.	FLC: para 244.

4.3.13.4	Thermostats.	FLC: para 245.
4.3.13.5	Pressure caps.	FLC: para 246.
4.3.13.6	Temperature indicators.	FLC: para 248.
4.3.13.7	AFV cooling systems.	TCC: Instr 1 paras 126 to 138 and RSP: no 6- 27-1 sec 7.
4.3.14	Know the operating principles of vehicle electrical systems and the functions of the following:	
4.3.14.1	Vehicle electricity and lead- acid storage batteries.	AEE: paras 1 to 58.
4.3.14.2	Cranking motors and controls.	AEE: paras 99 to 113 and TCC: Instr 1 paras 242 to 267.
4.3.14.3	Generators and regulators.	AEE: paras 151 to 157, 162 to 169 & 176 to 178.
4.3.14.4	Battery ignition systems.	AEE: paras 227 & 234 to 247.
4.3.14.5	Electrical horns, switches, fuses, circuit breakers, lights and indicating devices.	AEE: paras 261, 262, 272 to 274 & 276 and CTH: pp 151 to 153.
4.3.14.6	Magneto ignition systems.	PAV: paras 151 to 159 and TCC: Instr 1 paras 144 to 241.
4.3.14.7	Auxiliary chargers.	CTH: pp 99 to 101 & 337 to 343 and RSP: no 6- 27-1 sec 10.
4.3.15	Know the operating principles of diesel engines and fuel systems and the functions of their components.	PAV: paras 9, 74 to 76 & 80 to 82 and GMD: sec 15 pp 1 to 6.
4.3.16	Know the general layout and construction of AFVs.	CUH: pp 7 to 16, 19, 41 to 44, 56 & 76 to 79 and RSP: no 6-27-1 secs 1 & 2.
4.3.17	Know the operating principles and functions of the following AFV power train components:	
4.3.17.1	Basic power trains.	PAV: paras 186 to 188 & 190.
4.3.17.2	Clutches.	RSP: no 6-27-1 sec 11 and TCC: Instr 4 paras 5 to 28 and PAV: paras 191 to 194.

4.3.17.3	Transmissions and transfer cases.	RSP: no 6-27-1 secs 13 & 15 and TCC: Instr 4 paras 29 to 209 and PAV: paras 199 to 201.
4.3.17.4	Drive lines.	RSP: no 6-27-1 sec 14 and PAV: paras 214 & 215.
4.3.17.5	Differentials and final drives.	RSP: no 6-27-1 sec 15 and TCC: Instr 4 paras 210 to 226 and PAV: paras 217, 218, 220 & 230.
4.3.17.6	Anti-friction bearings, oil seals and gaskets.	AFB: paras 3 to 8, 52 & 53.
4.3.18	Know the operating principles and functions of the following components of AFV suspension and track systems:	
4.3.18.1	Springs and suspension assemblies.	RSP: no 6-27-1 sec 16 and TCC: Instr 7 paras 2 to 16 and PAV: paras 241 to 243.
4.3.18.2	Shock absorbers and linkages.	TCC: Instr 7 paras 17 to 32.
4.3.18.3	Road wheels.	TCC: Instr 7 paras 33 to 35.
4.3.18.4	Support and guide rollers and idler wheels.	TCC: Instr 7 paras 36 to 46.
4.3.18.5	Tracks.	TCC: Instr 7 para 47.
4.3.19	Know the operating principles of AFV steering and braking systems and the functions of their components.	TCC: Instr 5 and RSP: no 6-27-1 sec 15.
4.3.20	Know the functions of the Ben- dix electronic ignition analyser and the engine test equipment in current use and the purposes for which they may be used.	BIA: form MG 757 paras 2-1 to 2-8 and AEM.
4.3.21	Know the methods used to carry out the following tests, repairs and adjustments on Centurion and M4A2 AFVs (excluding Centurion main engines):	
4.3.21.1	Remove and replace engine accessories.	GME: paras 20 to 41 & 146 to 167.

4.3.21.2	Remove, clean, check and replace cylinder heads, valves, valve guides, valve lifters and camshafts and grind, reseat and adjust valves.	TCC: Instr 2 paras 19, 20, 31 & 32 and CTH: pp 645, 648, 649, 652 & 661 to 663 and GMD: secs 9, 11 & 15 pp 18 to 20 and ENG: paras 197 to 216 and GME: paras 42 to 47, 102 to 104 & 137 to 145 and RMD: Instr 1 paras 156 to 158, 161, 165, 166, 241 to 247 & 337 to 344.
4.3.21.3	Remove, clean, check and replace pistons, piston rings, piston pins, connecting rods and oil pans and clean and prepare the cylinder block for inspection.	TCC: Instr 2 paras 25 to 28 and CTH: pp 646, 649, 651, 661 & 662 and GMD: sec 6 and ENG: paras 218 to 231 and GME: paras 49 to 52, 105 to 107 & 131 to 135 and RMD: Instr 1 paras 212 to 240.
4.3.21.4	Remove cylinder ridges and clean cylinders.	ENG: paras 218 & 242 to 249 and GME: para 117 and AEM.
4.3.21.5	Remove and replace starting motors, electric fuel pumps, carburetors, intake manifolds, fuel tanks and fuel level sending units.	CTH: pp 327, 328, 334, 335 & 553 to 556 and RSP: no 6-27-1 sec 8 and GMD: sec 18 pp 7 & 8.
4.3.21.6	Remove, repair and replace oil pumps, filters, mechanical fuel pumps and fuel lines and fittings.	CTH: pp 273 to 275, 443 & 447 to 480 and GMD: secs 12 & 15 pp 21 to 30 and FLC: paras 155, 218 to 224 & 231 to 235 and GME: paras 49, 87 to 90 & 105 to 135 and RMD: Instr 1 paras 250 to 266 & 369 to 377.
4.3.21.7	Remove, repair and replace components of the cooling systems (excluding radiator repairs).	CTH: pp 280, 288 to 294 & 333 and RSP: no 6- 27-1 sec 7.
4.3.21.8	Remove and install auxiliary engines.	CTH: pp 636 to 639 and CUH: pp 45 to 51 and RSP: no 6-27-1 sec 10.
4.3.21.9	Pressure test cooling systems.	EME: Veh J284 Instr 1.
4.3.21.10	Remove, repair, replace and adjust steering and braking systems.	CTH: pp 301 to 308 and RSP: no 6-27-1 sec 15.
4.3.21.11	Remove and replace clutch assemblies and transmissions.	CTH: pp 543, 546, 560, 596 & 597 and RSP: no 6-27-1 sec 15.

4.3.21.12	Remove, repair, replace and adjust track and suspension components.	CTH: pp 313 to 321 & 612 to 626 and TCC: Instr 7 and RSP: no 6- 27-1 sec 16.
4.3.21.13	Remove and replace bilge pumps and flame detector switch harness assemblies.	CTH: pp 353 to 356.
4.3.21.14	Adjust the M4A2 tank engine governor and fuel pump injector and the Centurion auxiliary engine governor.	TCC: Instr 2 paras 77 to 82 and GMD: sec 16 pp 1 to 3 & sec 19 pp 13 to 20.
4.3.22	Know the various types of spark plugs used on AFVs and be able to remove, test, adjust and replace them.	SPK and CTH: pp 279 & 343.
4.3.23	Know the safety precautions for operating Centurion and M4A2 tanks and be able to start and stop them and move them safely within an enclosed area.	IDP and RSP: no 6-27-1 secs 4 & 10.
4.3.24	Be able to service AFVs and lubricate them - using standard manual and power - operated equipment.	EME: Veh A123, Veh A124, Veh A153 Instr 1, Veh A453 & Veh J289 Instr 3 and RSP: no 6-27-1 secs 6 & 8 to 10 and CCS: part 1 and TCC: Instr 1.
4.3.25	Be able to test, remove, service and replace lead-acid type storage batteries.	CTH: p 332 and RSP: no 6-27-1 sec 9.
4.3.26	Be able to replace coolant hoses and thermostats.	TCC: Instr 1 paras 129 to 134 and RSP: no 6- 27-1 sec 7.
4.3.27	Be able to service air cleaners and breathers.	CUH: paras 154 to 157 and RSP: no 6-27-1 secs 8 & 10.
4.3.28	Be able to replace fuel and oil filters.	CUH: paras 99,101,142, 225 & 264 to 267 and RSP: no 6-27-1 secs 6, 8 & 10.
4.3.29	Be able to remove, replace and adjust headlamps.	CTH: pp 322 to 326.
4.3.30	Be able to remove, replace and adjust AFV tracks and road wheels.	CTH: pp 313 to 315 and RSP: no 6-27-1 sec 16.
4.3.31	Know safety precautions for AFV recovery.	REC: paras 222 to 227.

Group 2

4.4. In addition to the requirements for group 1, and to perform his duties satisfactorily, the group 2 tradesman must be able to carry out the following tests, adjustments and repairs on the Centurion and M4A2 AFVs (excluding Centurion main engines):

4.4.1	Remove, clean, check and replace cylinder heads, valves, valve guides, valve lifters and camshafts and grind, reseat and adjust valves.	TCC: Instr 2 paras 19, 20, 31 & 32 and CTH: pp 645, 648, 649, 652 & 661 to 663 and GMD: secs 9, 11 & 15 pp 18 to 20 and ENG: paras 197 to 216 and GME: paras 42 to 47, 102 to 104 & 137 to 145 and RMD: Instr 1 paras 156 to 158, 161, 165, 166, 241 to 247 & 337 to 344.
4.4.2	Remove, clean, check and replace pistons, piston rings, piston pins, connecting rods and oil pans and clean and prepare the cylinder block for inspection.	TCC: Instr 2 paras 25 to 28 and CTH: pp 646, 649, 651, 661 & 662 and GMD: sec 6 and ENG: paras 218 to 231 and GME: paras 49 to 52, 105 to 107 & 131 to 135 and RMD: Instr 1 paras 212 to 240.
4.4.3	Remove cylinder ridges and clean cylinders.	ENG: paras 218 & 242 to 249 and AEM and GME: para 117.
4.4.4	Remove and replace starting motors, electric fuel pumps, carburetors, intake manifolds, fuel tanks and fuel level sending units.	CTH: pp 327, 328, 334, 335 & 553 to 556 and RSP: no 6-27-1 sec 8 and GMD: sec 18 pp 7 & 8.
4.4.5	Remove, repair and replace oil pumps, filters, mechanical fuel pumps and fuel lines and fittings.	CTH: pp 273 to 275, 443 & 477 to 480 and GMD: secs 12 & 15 pp 21 to 30 and FLC: paras 155, 218 to 224 & 231 to 235 and GME: paras 49, 87 to 90 & 105 to 135 and RMD: Instr 1 paras 250 to 266 & 369 to 377.
4.4.6	Remove, repair and replace components of the cooling systems (excluding radiator repairs) .	CTH: pp 280, 288 to 294 & 333 and RSP: no 6-27-1 sec 7.
4.4.7	Remove and install auxiliary engines.	CTH: pp 636 to 639 and CUH: pp 45 to 51 and RSP: no 6-27-1 sec 10.
4.4.8	Pressure test cooling systems.	EME: Veh J284 Instr 1.

4.4.9	Remove, repair, replace and adjust steering and braking systems.	CTH: pp 301 to 308 and RSP: no 6-27-1 sec 15.
4.4.10	Remove and replace clutch assemblies and transmissions.	CTH: pp 543, 546, 560, 596 & 597 and RSP: no 6-27-1 sec 15.
4.4.11	Remove, repair, replace and adjust track and suspension components.	CTH: pp 313 to 321 & 612 to 626 and TCC: Instr 7 and RSP: no 6-27-1 sec 16.
4.4.12	Remove and replace bilge pumps and flame detector switch harness assemblies.	CTH: pp 353 to 356.
4.4.13	Adjust the M4A2 tank engine governor and fuel pump injector and the Centurion auxiliary engine governor.	TCC: Instr 2 paras 77 to 82 and GMD: sec 16 pp 1 to 3 & sec 19 pp 13 to 20.

Group 3

4.5. In addition to the requirements for group 2, and to perform his duties satisfactorily, the group 3 tradesman must:

4.5.1	Be able to use and care for telescopic and small-hole gauges, protractors, surface plates, dial indicators, vernier calipers and height gauges.	MTO: pp 59 to 80, 98 to 103 & 147 to 160 and HMT: paras 73 & 81.
4.5.2	Know the purpose and use of abrasives used in his trade and be able to dress grinding wheels.	OMT: paras 42 & 45 and AEM.
4.5.3	Be able to prepare free-hand dimensional working sketches.	DFT: paras 162 to 169 & 183 to 190.
4.5.4	Be able to use oxy-acetylene welding equipment for cutting and making emergency repairs for recovery operations.	WTA: paras 36 to 44, 54 to 64, 66, 68 to 81, 83, 84, 87, 88 & 114 to 117.
4.5.5	Know the effects of heating, cooling and mechanical working of common metals and alloys.	WTA: paras 51 to 53 and RSP: no 2-5-4.
4.5.6	Be able to test, repair and adjust carburetors and engine governors used on AFVs.	CTH: pp 493 to 498 & 657 to 660 and GMD: sec 16.
4.5.7	On Centurion tanks, be able to:	

4.5.7.1	Remove, time, test, install and adjust the main engine.	CTH: pp 433 to 440 & 524 to 537 and TCC: Instr 1.
4.5.7.2	Remove and replace gearboxes, clutches and final drives and adjust clutches.	CTH: pp 543 to 546, 560 & 596 to 598 and RSP: no 6-16-6 part 2 and TCC: Instrs 1 & 2.
4.5.7.3	Test, adjust, remove and replace faulty components of battery and magneto ignition systems and engine electrical accessories.	CTH: pp 276 to 279 & 334 to 348 and TCC: Instrs 4 & 5.
4.5.8	On M4A2 tanks, be able to:	
4.5.8.1	Remove, repair, install and adjust the main engine and clutch.	RSP: no 6-27-1 secs 11 & 12 and GMD: secs 1 to 16 & 19.
4.5.8.2	Remove and replace transfer cases, drive shafts, final drives, transmissions and controlled differentials.	RSP: no 6-27-1 secs 13 to 15.
4.5.8.3	Remove, repair and replace component parts of fuel and lubricating systems.	RSP: no 6-27-1 secs 6 & 8 and GMD: secs 12, 14 & 15.
4.5.8.4	Remove and replace component parts of cooling and electrical systems.	RSP: no 6-27-1 secs 7 & 9 and GMD: sec 13.
4.5.8.5	Synchronize the M4A2 engines.	RSP: no 6-27-1 pp 53 & 54.
4.5.9	On Ferret scout cars, be able to:	TSD: chap 5 secs 1, 3 to
4.5.9.1	Remove, repair, replace, test and adjust the engine (excluding crankshaft).	7, 9 & 14 and SCF: paras 40 to 50.
4.5.9.2	Remove, repair and replace component parts of fuel, lubricating, cooling and ignition systems.	TSD: chap 1 & chap 5 secs 17B, 18B & 19 to 22 and EME: Veh N023 Instrs 2 & 4 & Veh N024 Instr 3 and SCF: para 34.
4.5.9.3	Remove, repair and replace component parts of fluid flywheels, transmissions, transfer cases, propeller shafts, bevel boxes and wheel hubs.	EME: Veh N023 Instr 6 & Veh N024 Instr 1 sec 2 & Instrs 4 & 5 and SCF: paras 39 to 157.
4.5.9.4	Remove, repair and replace component parts of steering, braking and suspension systems and road wheels.	EME: Veh N023 Instrs 7 & 8 & Veh N024 Instrs 6, 7 & 9 and SCF: paras 158 to 231.

4.5.9.5	Test, remove and replace components of electrical accessory equipment, charging systems and starting systems.	SCF: paras 232 to 306, 325 to 428 & 447 to 454 and TSD: chap 5 secs 23B to 23D & 24E.
4.5.10	Know the construction and operating principles of the International Harvester, Caterpillar and Cummins diesel engines and be able to repair, test and adjust their fuel systems.	CAT: pp 1 to 115 and CSM and CDE: secs 1 to 12 and IHB and IHD: paras 272 to 277 and OMC: secs 1, 2 & 5 and RBC: pp 86 to 142 and PAV: paras 9c, 9d, 75, 76 & 85 and HSD: pp 167, 185, 186 & 409 to 420 & chap 17 and OMI: pp 60, 61, 64 to 67 & 77.
4.5.11	Be able to operate, test, adjust and repair reciprocating type air compressors.	IRH: part 1.
4.5.12	Be able to operate, test, adjust and repair rotary type air compressors.	CBL: pp 3, 4 & 33 to 43 and RSP: no 6-30-16.
4.5.13	Know the operating principles of motorized graders and be able to test, adjust and repair their:	
4.5.13.1	Engines.	MMA: sec 1.
4.5.13.2	Transmissions.	MMA: sec 2.
4.5.13.3	Tandems.	MMA: sec 3.
4.5.13.4	Brakes.	MMA: sec 4.
4.5.13.5	Power controls.	MMA: sec 5.
4.5.13.6	Blade controls.	MMA: sec 6.
4.5.13.7	Circle and circle reverses.	MMA: secs 7 & 12.
4.5.13.8	Front axle and front lean mechanisms.	MMA: secs 8 & 9.
4.5.13.9	Steering.	MMA: sec 10 pp 5, 6 & 8 and RSG: paras 79 to 89.
4.5.13.10	Wheels.	MMA: sec 14.
4.5.13.11	Scarifier mechanisms.	MMA: sec 11.
4.5.14	Know the operating principles of crawler type tractors and be able to test, adjust and repair their:	

4.5.14.1	Flywheel clutches.	SRB: pp 71 to 81 and IHC: paras 30 to 42.
4.5.14.2	Transmissions.	SRB: pp 81 to 108 and IHC: paras 464 to 471.
4.5.14.3	Bevel drives.	SRB: pp 109 to 118 and IHC: paras 472 to 478.
4.5.14.4	Steering brakes and clutches.	SRB: pp 120 to 136 and IHC: paras 345 to 400.
4.5.14.5	Final drives.	SRB: pp 137 to 151 and IHC: paras 278 to 344.
4.5.14.6	Track frames and tracks.	SRB: pp 153 to 187 and IHC: paras 401 to 463.
4.5.15	Know the operating principles of crane shovels and be able to test, adjust and repair their:	
4.5.15.1	Boom hoists and clutch shafts.	LOM: pp 99 to 106.
4.5.15.2	Swing mechanisms.	LOM: pp 107 to 110.
4.5.15.3	Hoist drums.	LOM: pp 110A to 111.
4.5.15.4	Power take-offs.	LOM: pp 111 to 117.
4.5.15.5	Turntable thrust rollers.	LOM: p 117.
4.5.15.6	Crawler mechanisms.	LOM: pp 118 to 123.
4.5.15.7	Attachments.	LOM: pp 124 to 129.
4.5.16	Know the operating principles of, and be able to operate and maintain, the medium wrecker M62 and the Centurion ARV.	OOM: paras 12 to 53, 57 to 77, 262, 263, 267, 268, 270a, 271a(2), 272a(l), 273a & 273b and ARV: paras 1 to 217 & 318 to 335.
4.5.17	Know the soil characteristics which affect recovery operations and be able to select and lay out recovery equipment and recover AFV casualties.	REC: chap 2 paras 214 to 217 & 228 to 231, chaps 3 to 8, chap 9 paras 901 to 909, chap 10, chap 11 paras 1101 to 1105 & 1110 to 1113, chaps 12 & 14 & anxs A to G.
4.5.18	Be able to use engine and electrical test equipment to carry out engine and electrical system trouble-shooting and tune-ups.	AEE: chaps 18 & 19 and AEM and ARV: p 39 and TSD: chap 5 secs 23B to 23D & 24E.

4.5.19	Know the purpose of the controls on the Bendix electronic ignition analyser and be able to connect it to both battery and magneto ignition systems and recognize the wave form of a properly operating ignition system.	BIA: form MG 757 sec 3 & form L 467, paras 1-2, 1-3, 2-3 to 2-8, 2-17 to 2-31, 2-39 to 2-44 & 2-79 to 2-82.
4.5.20	Be able to trouble-shoot and diagnose faults in and tune up AFV gasoline and diesel engines.	TSD: chap 4 and ARV: pp 37 & 38 and GMD: sec 19 and ENG: chaps 11 & 12 and RSP: no 6-16-6 part 1.
4.5.21	Be able to trouble-shoot and diagnose faults in the pre-selector type gear box.	EME: Veh N023 Instr 6 & Veh N024 Instr 4 p 27.

5. Responsibility

5.1. The Vehicle Mechanic Tracked Group 1 is responsible under direct supervision, and the group 2 tradesman under general supervision, for locating minor faults and making certain repairs and adjustments to Centurion and M4A2 tanks.

5.2. The group 3 tradesman is responsible, under minimum supervision, for more detailed fault finding and repairs to Centurion and M4A2 tanks, Ferret scout cars and mobile engineer equipment.

6. Working Conditions

6.1. Physical

6.1.1. His duties involve considerable effort when handling heavy tools and AFV components.

6.1.2. In the field his duties are performed under cover or in the open. In static locations he normally works inside.

6.2. Stress

6.2.1. Mental stress is normal.

6.3. Occupational Hazards

6.3.1. The normal hazards are cuts, bruises and abrasions and exposure to skin irritations from petroleum products.

6.3.2. When working on recovery, more serious injuries may occur.

7. Method of Qualification

7.1. Qualification for Group 1

7.1.1. Qualification may be obtained by passing a course authorized by Army Headquarters.

7.1.2. The scope of the course will include the requirements of paragraph 4.3 of this specification.

7.2. Qualification for Group 2

7.2.1. To qualify as a Vehicle Mechanic Tracked Group 2, the candidate must be qualified as a Vehicle Mechanic Tracked Group 1.

7.2.2. Qualification may then be obtained by passing a trade test authorized by Army Headquarters, after having been certified by his commanding officer as proficient in the requirements of paragraph 4.4 of this specification.

7.2.3. The scope of the trade test will include the requirements of paragraph 4.4 of this specification.

7.3. Qualification for Group 3

7.3.1. To qualify as a Vehicle Mechanic Tracked Group 3, the candidate must:

7.3.1.1. Be qualified as a Vehicle Mechanic Tracked Group 2; and

7.3.1.2. Be certified proficient by his commanding officer in the requirements of paragraphs 4.5.1 to 4.5.5 of this specification.

7.3.2. Qualification may then be obtained by passing a course authorized by Army Headquarters.

7.4. The scope of the course will include the requirements of paragraphs 4.5.6 to 4.5.21 of this specification.

8. Career Possibilities

8.1. Trade Progression

8.1.1. A Vehicle Mechanic Tracked Group 3 may progress to Master Vehicle Technician Group 4.

9. Related Occupations

9.1. Navy - None

9.2. Air Force - Mobile Support Equipment Technician Group 3

9.3.

Dictionary of Civilian Occupational Titles	Code Number
Tractor Mechanic (any ind.)	5-81.040
Diesel Mechanic (any ind.)	5-83.931
Tank Mechanic (tank ind.)	5-05.810

10. Implementing Instructions

10.1. This new specification replaces that for Vehicle Mechanic Tracked Groups 1, 2 and 3 dated 23 Feb 54. It is written in the new specification format to describe more fully the specific skills and knowledge required and to detail the training references.

10.2. The other major changes in this specification are:

10.2.1. The introduction of more practical skills in repair at the lower groups.

10.2.2. The postponement of some measuring and layout work to group 3.

10.2.3. The deletion of preservation procedures.

10.2.4. The addition of emergency welding and cutting.

10.2.5. The addition of work on the “medium” wrecker and on a variety of mobile engineer equipment not previously specified.

10.2.6. The addition of repairs to the Ferret scout car and use of the ARV winch.

10.2.7. The change in the method of qualification for group 3 from a complete course to certification in one portion and a qualifying course in the other.

10.3. Personnel qualified as a Vehicle Mechanics Tracked are considered qualified in accordance with this new specification but must be given in-job-training on each serial of this specification which has not been covered in previous training.

Effective Date: 1 Jul 63

Vehicle Mechanic (Wheeled)
Groups 1 & 2 & 3, 1963

Vehicle Mechanic Wheeled Groups 1, 2 and 3

Army Trade Specification V.05

1. General Information

1.1. Classification

Full Title	Abbreviation	Code Number
Vehicle Mechanic Wheeled	Veh Mech Wh	Group 1 7821
		Group 2 7822
		Group 3 7823

1.2. Selection Requirements

1.2.1. Candidates must be members of The Corps of Royal Canadian Electrical and Mechanical Engineers or be willing to, and acceptable for, transfer to that corps.

1.2.2. Minimum “M” score and educational level: 130 and Grade 8.

1.2.3. PULHEMS Profile

Battle	Support	Base
2233312	2233313	3334314

2. Summary

2.1. Finds faults in and tests, adjusts and repairs wheeled vehicles, motorcycles and the armoured tracked carrier. Performs common recovery tasks using a recovery vehicle.

3. Duties and Tasks

3.1. Performs bench fitting operations such as filing, grinding, pressing, reaming and threading.

3.2. Checks, tests, adjusts and repairs ignition, generator and starting systems using vehicle electrical test equipment.

3.3. Checks engine condition and finds faults by taking compression and vacuum readings and by sight and sound.

3.4. Strips, repairs and reassembles vehicle engines.

3.5. Strips, repairs and reassembles carburetors, distributors, water pumps and fuel pumps.

3.6. Checks, repairs and adjusts mechanical, hydraulic and air-assisted hydraulic braking systems.

3.7. Repairs steering systems and suspensions.

3.8. Removes, strips, repairs and reassembles standard transmissions, transfer

cases, drive shafts and front and rear differentials.

3.9. Removes, repairs and replaces clutches and fluid drive units.

3.10. Adjusts automatic transmissions.

3.11. Services batteries.

3.12. Road tests vehicles to determine and locate faults and to ensure repairs have been completed satisfactorily.

3.13. Operates a recovery vehicle to perform common recovery tasks.

3.14. Uses oxy-acetylene welding equipment for cutting and to make emergency repairs during recovery operations.

3.15. Lubricates vehicles and does seasonal servicing.

3.16. Strips, repairs, reassembles, tests and adjusts motorcycles.

3.17. Instructs junior tradesmen in the performance of their duties.

4. Training, Experience, Skills and Knowledge Required

4.1. The tradesman requires the skills and knowledge described in this specification. The degree of skill and knowledge will be determined from the references listed for each trade group. To qualify in a particular group, he must reach the level shown but not any higher level.

4.2. Only the publications shown below will be used as reference material:

ACB - Automotive Chassis and Body by W. H. Crouse - 2nd Edition - 1959.

AEE - Automotive Electrical Equipment by W. H. Crouse - 4th Edition - 1959.

AEM - Applicable equipment manual.

AFB - United States Technical Manual, TM 9-214 - Antifriction Bearings - Nov 59.

ALE - United States Technical Manual, TM 9-1825B - Electrical Equipment - (Autolite) - Nov 52.

BIA - NATO stock no 7610-21-102-2614 - Bendix Ignition

Analyser.

BOB - Notes on Canadian Armoured Tracked Carrier (Bobcat) - Development Phase - Jul 58 (Confidential).

BRK - United States Technical Manual, TM 9-8651 - Power Brake Systems (Bendix BK) - Jan 56.

BWH - United States Technical Manual, TM 9-1827A - Power Brake Systems (Bendix Westinghouse) - Feb 53.

CAC - United States Technical Manual, TM 9-1826A - Carburetors (Carter) - Dec 52.

CEC - United States Technical Manual, TM 9-1837A - Engine and Clutch (Continental) - Apr 52.

CGH - United States Technical Manual, TM 9-8647 - Carburetors and Governors - (Holley) - Aug 58.

COC - Canadian Ordnance Catalogue.

CSA - Mechanical Engineering Drawing Standards B78.1 - 1954 by Canadian Standards Association.

CTS - NATO stock no 7610-21-102-2412, (TM 9-8024) - 2J-ton 6X6 Cargo Truck M135 - Oct 55.

DFT - United States Technical Manual, TM 5-230 - General Drafting - Oct 62.

DRE - United States Technical Manual, TM 9-8627 - Electrical Equipment - (Delco-Remy) - Jim 53.

ECW - United States Technical Manual, TM 9-1804A - Engine and Clutch for 1-ton 4X4 Utility Truck M38 - Jun 51.

EFP - United States Technical Manual, TM 9-1828A - Fuel Pumps - Dec 52.

EME - Canadian Army Electrical and Mechanical Engineering Manual.

ENG - Automotive Engines by W. H. Crouse - 2nd Edition - 1959.

FLC - Automotive Fuel, Lubricating and Cooling Systems by W. H. Crouse - 2nd Edition - 1959.

GMB - General Mathematics - Book 1 by Jackson, Dean and Crawford - 1942.

GME - United States Technical Manual, TM 9-8025-1 - GMC Model 302 Engine - May 58.

HMT - United States Technical Manual, TM 9-243 - Use and Care of Handtools and Measuring Tools - Sep 60.

HTM - United States Technical Manual, TM 9-8025-2 - Ordnance Field and Depot Maintenance, 301 MG and 303 M Hy- dramatic Transmissions - Jun 57.

MTO - Machine Tool Operation - Part I by Burghardt, Axelrod and Anderson - 5th Edition - 1959.

OMT - United States Technical Manual, TM 9-242 - Fundamentals of Ordnance Corps Machine Tools - Feb 59.

OOM - NATO stock no 7610-21-102-1975 (TM 9-8028) - 5-ton 6X6 Cargo Truck - Jun 55.

PAV - United States Technical Manual, TM 9-8000 - Principles

of Automotive Vehicles - Jan 56.

PBE - United States Technical Manual, TM 9-8601 - Power Brake Equipment - Dec 54.

PTB - United States Technical Manual, TM 9-1804B - Power Train, Body and Frame - 5-ton 4X4 Utility Truck M38 - Jul 52.

PTR - United States Technical Manual, TM 9-1819AC, 2J-ton

Power Train - Dec 52.

PTT - United States Technical Manual, TM 9-1837B - Power Train - 5-ton 6X6 Cargo Truck - Sep 52.

REC - Canadian Army Manual of Training, CAMT 11-4 -

Recovery - 1962.

RMD - Canadian Army EME Manual - Veh D 114 - Repair Manual - Truck f-ton Dodge.

RSG - United States Technical Manual, TM 9-8615 - Steering Gears (Ross Gear and Tool Co) - Jun 53.

RSP - RCEME School Precis.

SAF - Safety Manual for Government Departments and Crown Agencies - Department of Labour, Canada - 1958.

SPK - United States Technical Manual, TM 19-8638 - Spark Plugs used on Ordnance Material - Dec 56.

STC - Canadian Army Manual for RCASC Supplies, Transport and Services.

THB - British EMER - Wheeled Vehicles B722 - Motorcycle 500 cc - Triumph.

UTT - United States Technical Manual, TM 9-8012 - 5-ton 4 X 4 Utility Truck M38 - Jan 56.

WTA - United States Technical Manual, TM 9-237 - Welding, Theory and Application - Oct 58.

Group 1

4.3. To perform his duties satisfactorily, the group 1 tradesman must:

4.3.1	Know the safety precautions for workshops and, in particular, those applicable to the vehicle sections.	RSP: no 6-1-4 and SAF: chaps 6 & 8 to 14 and EME: Man V101 & Man V300.
4.3.2	Be able to use and care for:	
4.3.2.1	Feeler gauges, squares, calipers and micrometers.	HMT: paras 34 to 48, 69 to 73 & 78 to 81.
4.3.2.2	Common vehicle mechanic hand tools.	ENG: paras 254 to 264 & 272 to 274.
4.3.2.3	Drill presses, portable electric drills, twist drills and pedestal grinders.	OMT: paras 18 to 21, 24 to 34, 41 to 44, 48 to 51, 212 & 215.
4.3.3	Be able to:	

4.3.3.1	Solder - using soldering irons and blow torches.	HMT: paras 126 to 130 & 143 to 146.
4.3.3.2	Cut, flare and fit copper and steel tubing.	HMT: paras 216 to 218.
4.3.3.3	Ream to .002-inch tolerance.	HMT: paras 219 to 222.
4.3.3.4	Remove broken studs.	HMT: paras 235 to 239.
4.3.3.5	Bend and shape cold metal.	RSP: no 2-2-15.
4.3.4	Know the common thread forms and be able to use and care for taps and dies.	HMT: paras 223 to 234.
4.3.5	Know the types of standard hardware, commonly known as “expendable stores”, used in the construction and repair of vehicles.	RSP: no 2-2-21/1 and COC.
4.3.6	Be able to add, subtract, multiply and divide whole numbers, fractions and decimals, to calculate percentages and to use simple algebraic formulae.	GMB: pp 8 to 14, 27 to 87 & 145 to 147.
4.3.7	Be able to read simple mechanical drawings.	DFT: paras 46, 48, 124, 130, 132 to 135, 146, 155, 156, 170, 171, 180, 181a, 182a, 191, 193, 194, 301b, 302a, 303, 304, 311 & 313c and CSA: paras 6.1 & 6.2.
4.3.8	Understand the fundamental principles of fluid and air pressures, vacuum, gravity, work, energy, power, motion, heat and friction and their application.	ENG: paras 1 to 18 & 23 to 28 and ACB: paras 1 to 26.
4.3.9	Know the basic characteristics and uses of metals in common use and be able to identify them.	WTA: paras 24 to 28.
4.3.10	Know the construction and operating principles of gasoline engines and the functions of their components as follows:	
4.3.10.1	Cylinder and valve arrangements, engine performance measurements and engine types.	ENG: paras 49 to 54 & 64 to 86.
4.3.10.2	Cylinder block and cylinder head construction.	ENG: paras 90 to 93.
4.3.10.3	Engine gaskets.	ENG: para 94.

4.3.10.4	Exhaust and induction systems and manifold heat controls.	ENG: paras 96 to 99 and GME: para 102 and CTS: para 135.
4.3.10.5	Crankshafts, crankshaft hearings, connecting rods, pistons and piston rings.	ENG: paras 100 to 106, 110 to 120 & 223.
4.3.10.6	Cams, camshafts, valves, valve trains and hydraulic valve lifters.	ENG: paras 121 to 133.
4.3.10.7	Engine lubrication and lubrication systems.	ENG: paras 96 & 161 to 167 and FLC: paras 200 to 208 and PAV: paras 105 & 106.
4.3.11	Know the construction and operating principles of gasoline engine fuel systems and the function of the tanks, filters, screens, gauges, pumps, air cleaners and carburetors.	FLC: paras 36 to 48, 52 to 55, 57 to 72 & 77.
4.3.12	Know the basic types and uses of automotive fuels and lubricants and be able to locate specific information concerning them.	STC: vol 4 para 59.02 & anx 4H and FLC: paras 100 to 115 & 210 to 216.
4.3.13	Know the operating principles of the engine cooling systems and the functions of the following components:	
4.3.13.1	Water jackets and pumps.	FLC: paras 237 to 241.
4.3.13.2	Engine fans and radiators.	FLC: paras 242 & 243.
4.3.13.3	Hot water heaters.	FLC: para 244.
4.3.13.4	Thermostats.	FLC: para 245.
4.3.13.5	Pressure caps.	FLC: para 246.
4.3.13.6	Temperature indicators.	FLC: para 248.
4.3.14	Know the operating principles of automotive electrical systems and the functions of the following:	
4.3.14.1	Vehicle electricity and lead-acid storage batteries.	AEE: paras 1 to 58.
4.3.14.2	Cranking motors and controls.	AEE: paras 99 to 113.
4.3.14.3	Generators and regulators.	AEE: paras 151 to 157, 162 to 169 & 176 to 178.
4.3.14.4	Battery ignition systems.	AEE: paras 227 & 234 to 247.

4.3.14.5	Electrical horns, switches, fuses, circuit breakers, lights, indicating devices, wipers and heaters.	AEE: paras 261 to 263, 265, 269, 272 to 274, 276, 279, 283 & 284.
4.3.15	Know the operating principles of automotive power trains and the functions of the following components:	
4.3.15.1	Basic power trains.	PAV: paras 186 to 189.
4.3.15.2	Clutches and fluid couplings.	PAV: paras 191 to 196.
4.3.15.3	Transmissions and transfer cases.	PAV: paras 199 to 201, 203, 209 & 210 and RSP: no 6-14-2.
4.3.15.4	Drive lines.	PAV: paras 214 to 216.
4.3.15.5	Differentials and drive axles.	PAV: paras 217, 218 & 222 to 228.
4.3.15.6	Anti-friction bearings.	AFB: paras 3 to 8.
4.3.15.7	Oil seals and gaskets.	AFB: paras 52 & 53.
4.3.16	Know the operating principles and functions of automotive chassis, springs and shock absorbers.	ACB: paras 27 to 31, 36 to 46, 51 & 52 and PAV: paras 233 to 240 & 309 to 312.
4.3.17	Know the operating principles of mechanical, hydraulic and air-hydraulic brake systems and the functions of their components.	ACB: paras 33 & 174 to 184 and BRK: paras 22, 23 & 162 to 165 and PAV: paras 278 to 288, 292, 296 to 299 & 302.
4.3.18	Know the operating principles of the automotive steering system and the functions of its components.	ACB: paras 32 & 55 to 66 and PAV: paras 259 to 267 & 272 to 277.
4.3.19	Know the functions of the Bendix electronic ignition analyser and the engine test equipment in current use and the purposes for which they may be used.	BIA: form MG 757 paras 2-1 to 2-8 and AEM.
4.3.20	Know the methods used to carry out the following tests, adjustments and repairs on ¼-ton, ¾-ton and 2½-ton standard military pattern (SMP) vehicles:	

4.3.20.1	Remove and replace engine accessories.	ECW: paras 25 to 35 & 93 to 103 and GME: paras 20 to 41 & 146 to 167 and RMD: Instr 1 paras 82 to 103, 346 to 350, 361 to 369 & 378 to 390.
4.3.20.2	Remove, clean, check and replace cylinder heads, manifolds, valves, valve guides, valve lifters and camshafts and grind, reseat and adjust valves.	ECW: paras 32, 36 to 39, 42, 43, 54 to 63, 75 to 80, 90 & 91 and GME: paras 42 to 47, 102 to 104, 110, 124 & 137 to 145 and RMD: Instr 1 paras 117 to 126, 145 to 158, 165 to 167, 241 to 249, 292 to 319 & 336 to 345 and ENG: paras 197 to 216.
4.3.20.3	Remove, clean, check and replace pistons, piston pins, piston rings and connecting rods, and clean and prepare the cylinder block for inspection.	ECW: paras 40, 48 to 53 & 84 and GME: paras 51, 52, 106, 107, 117 & 131 to 133 and RMD: Instr 1 paras 212 to 240 and ENG: paras 218 to 231.
4.3.20.4	Remove cylinder ridges and clean cylinders.	ENG: paras 218 & 242 to 244 and AEM.
4.3.20.5	Remove, clean and replace oil pans, oil filters, oil pumps, by-pass valves and vents and repair oil pumps.	ECW: paras 28, 38, 43, 64 to 67, 89, 92 & 135 to 141 and GME: paras 29, 49, 50, 87 to 90, 93 to 96, 105, 134 & 135 and RMD: Instr 1 paras 104 to 116, 127 to 130, 250 to 266, 330 to 335, 351 to 360 & 369 to 377 and FLC: paras 218 to 224 & 230 to 235.
4.3.20.6	Remove, clean, repair, adjust and replace standard clutch assemblies.	ECW: paras 34, 86 & 127 to 134 and RMD: Instr 1 paras 74 to 81 & 455 to 490.
4.3.20.7	Remove and replace engine assemblies.	UTT: paras 115 to 119 and CTS: paras 116 to 120 and RMD: Instr 1 paras 24 to 57 & 417 to 454.

4.3.20.8	Remove and replace fuel system components and test and repair mechanical fuel pumps and fuel lines.	UTT: paras 127 to 136 and CTS: paras 125 to 128 & 131 to 133 and RMD: Instr 7 paras 1 to 6, 130 to 198, 218 to 221 & 250 to 252 and FLC: paras 148,154,155 & 157 to 165.
4.3.20.9	Remove and replace exhaust system components.	UTT: paras 137 to 139 and CTS: paras 137 to 140 and RMD: Instr 7 paras 253, 273 to 281 & 305 to 326 and FLC: paras 49 & 50.
4.3.20.10	Remove, test, repair and replace cooling system components (excluding radiator repair).	UTT: paras 120 to 126 and CTS: paras 141 to 149 and RMD: Instr 1 paras 267 to 281 & Instr 9 and FLC: paras 249 to 254 and GME: paras 83 to 86, 91 & 92.
4.3.20.11	Test and adjust battery ignition systems and replace distributor points.	UTT: paras 140 to 146 and CTS: paras 121 to 124 and RMD: Instr 8 paras 201 to 209, 223 to 248, 269 to 277 & 294 to 304 and AEE: paras 248 to 254.
4.3.20.12	Remove and replace electrical instruments, gauges, sending units, switches, fuses, circuit breakers and wiring.	UTT: paras 172 to 189 and CTS: paras 171 to 186 and RMD: Instr 8 paras 507 to 703.
4.3.20.13	Remove, repair and replace standard transmissions, transfer cases, universal joints, drive shafts, axle shafts and axle assemblies (excluding repair of differential assemblies).	UTT: paras 197 to 207 and PTB: paras 48 to 95, 100, 101 & 109 to 119 and CTS: paras 210 & 215 to 233 and PTR: paras 81 to 120 & 153 to 225 and RMD: Instr 2 paras 1 to 109, Instr 3, Instr 4, Instr 5 paras 1 to 20 & 122 to 153 & Instr 6.
4.3.20.14	Remove, repair, replace and adjust steering system components.	UTT: paras 232 to 239 and CTS: paras 216 & 267 to 272 and RMD: Instr 11.

4.3.20.15	Remove, repair, replace and adjust mechanical and hydraulic brake systems and mechanical and hydraulic components of air- assisted-hydraulic brake systems.	UTT: paras 228 & 240 to 247 and CTS: paras 234 to 242, 244, 245 & 253 to 256 and RMD: Instr 10.
4.3.20.16	Remove, repair and replace front and rear suspension units and shock absorbers.	UTT: paras 248 to 253 and CTS: paras 273 to 282 and PTR: paras 267 to 283 and RMD: Instr 13 paras 64 to 141 and PTB: paras 138 & 139.
4.3.20.17	Adjust front band and throttle linkage on hydra-matic transmissions.	CTS: paras 201 & 202.
4.3.20.18	Check vehicle frames for alignment.	PTB: para 180 and PTR: para 287 and RMD: Instr 13 paras 9 to 20 and ACB: para 232.
4.3.20.19	Balance wheels.	AEM and ACB: para 119.
4.3.21	Know the common types of tires and wheels used on service vehicles and the causes of irregular tire wear and be able to mount and dismount tires.	EME: Veh A761 secs 1 to 5 & 7 and ACB: para 85.
4.3.22	Know the various types of spark plugs used on wheeled vehicles and be able to remove, test, adjust and replace them.	SPK: secs 1 to 10 and UTT: para 145 and CTS: para 124 and RMD: Instr 8 paras 424 to 433.
4.3.23	Be able to service automotive vehicles and lubricate them, using standard manual and power-operated equipment.	EME: Veh A123, Veh A124, Veh A153 Instr 1 & Veh A453 and UTT: paras 66 to 71 & 132 and CTS: paras 70 to 74, 134 & 264 to 266 and RMD: Instr 7 paras 117 to 129 & Instr 12 paras 22 to 27 and BRK: para 182.
4.3.24	Be able to replace coolant hoses and thermostats and to replace and adjust fan belts.	UTT: paras 123, 125 & 126 and CTS: paras 145, 147 & 149 and RMD: Instr 9 paras 11 to 17 & 41 to 54.
4.3.25	Be able to remove and replace vehicle lights, starters, generators, regulators and batteries, and test and service lead-acid type batteries.	UTT: paras 147 to 161 and CTS: paras 150 to 165 and RMD: Instr 8 paras 2 to 4, 99 to 107, 193 to 200, 305 to 309, 419 to 422 & 482 to 639.

4.3.26	Be able to replace engine gaskets (excluding internal and head gaskets).	ENG: para 94 and AEM.
4.3.27	Be able to adjust toe-in.	UTT: para 234 and CTS: para 220 and RMD: Instr 4 para 132.
4.3.28	Know the safety precautions for vehicle recovery.	REC: paras 222 to 227.

Group 2

4.4. In addition to the requirements for group 1, and to perform his duties satisfactorily, the group 2 tradesman must be able to carry out the following tests, adjustments and repairs on ¼-ton, ¾-ton and 2½-ton SMP vehicles:

4.4.1	Remove, clean, check and replace cylinder heads, manifolds, valves, valve guides, valve lifters and camshafts and grind, reseat and adjust valves.	ECW: paras 32, 36 to 39, 42, 43, 54 to 63, 75 to 80, 90 & 91 and GME: paras 42 to 47, 102 to 104, 110, 124 & 137 to 145 and RMD: Instr 1 paras 117 to 126, 145 to 158, 165 to 167, 241 to 249, 292 to 319 & 336 to 345 and ENG: paras 197 to 216.
4.4.2	Remove, clean, check and replace pistons, piston pins, piston rings and connecting rods, and clean and prepare the cylinder block for inspection.	ECW: paras 40, 48 to 53 & 84 and GME: paras 51, 52, 106, 107, 117 & 131 to 133 and RMD: Instr 1 paras 212 to 240 and ENG: paras 218 to 231.
4.4.3	Remove cylinder ridges and clean cylinders.	ENG: paras 218 & 242 to 244 and AEM.
4.4.4	Remove, clean and replace oil pans, oil filters, oil pumps, bypass valves and vents and repair oil pumps.	ECW: paras 28, 38, 43, 64 to 67, 89, 92 & 135 to 141 and GME: paras 29, 49, 50, 87 to 90, 93 to 96, 105, 134 & 135 and RMD: Instr 1 paras 104 to 116, 127 to 130, 250 to 266, 330 to 335, 351 to 360 & 369 to 377 and FLC: paras 218 to 224 & 230 to 235.

4.4.5	Remove, clean, repair, adjust and replace standard clutch assemblies.	ECW: paras 34, 86 & 127 to 134 and RMD: Instr 1 paras 74 to 81 & 455 to 490.
4.4.6	Remove and replace engine assemblies.	UTT: paras 116 to 119 and CTS: paras 116 to 120 and RMD: Instr 1 paras 24 to 57 & 417 to 454.
4.4.7	Remove and replace fuels system components and test and repair mechanical fuel pumps and fuel lines.	UTT: paras 127 to 136 and CTS: paras 125 to 128 & 131 to 133 and RMD: Instr 7 paras 1 to 6, 130 to 198, 218 to 221 & 250 to 252 and FLC: paras 148, 154, 155 & 157 to 165.
4.4.8	Remove and replace exhaust system components.	UTT: paras 137 to 139 and CTS: paras 137 to 140 and RMD: Instr 7 paras 253, 273 to 281 & 305 to 326 and FLC: paras 49 & 50.
4.4.9	Remove, test, repair and replace cooling system components (excluding radiator repair).	UTT: paras 120 to 126 and CTS: paras 141 to 149 and RMD: Instr 1 paras 267 to 281 & Instr 9 and FLC: paras 249 to 254 and GME: paras 83 to 86, 91 & 92.
4.4.10	Test and adjust battery ignition systems and replace distributor points.	UTT: paras 140 to 146 and CTS: paras 121 to 124 and RMD: Instr 8 paras 201 to 209, 223 to 248, 269 to 277 & 294 to 304 and AEE: paras 248 to 254.
4.4.11	Remove and replace electrical instruments, gauges, sending units, switches, fuses, circuit breakers and wiring.	UTT: paras 172 to 189 and CTS: paras 171 to 186 and RMD: Instr 8 paras 507 to 703.

4.4.12	Remove, repair and replace standard transmissions, transfer cases, universal joints, drive shafts, axle shafts and axle assemblies (excluding repair of differential assemblies).	UTT: paras 197 to 207 and PTB: paras 48 to 95, 100, 101 & 109 to 119 and CTS: paras 210 & 215 to 233 and PTR: paras 81 to 120 & 153 to 225 and RMD: Instr 2 paras 1 to 109, Instr 3, Instr 4, Instr 5 paras 1 to 22 & 122 to 153 & Instr 6.
4.4.13	Remove, repair, replace and adjust steering system components.	UTT: paras 232 to 239 and CTS: paras 216 & 267 to 272 and RMD: Instr 11.
4.4.14	Remove, repair, replace and adjust mechanical and hydraulic brake systems and mechanical and hydraulic components of air-assisted-hydraulic brake systems.	UTT: paras 228 & 240 to 247 and CTS: paras 234 to 242, 244, 245 & 253 to 256 and RMD: Instr 10.
4.4.15	Remove, repair and replace front and rear suspension units and shock absorbers.	UTT: paras 248 to 253 and CTS: paras 273 to 282 and PTR: paras 267 to 283 and RMD: Instr 13 paras 64 to 141 and PTB: paras 138 & 139.
4.4.16	Adjust front band and throttle linkage on hydramatic transmissions.	CTS: paras 201 & 202.
4.4.17	Check vehicle frames for alignment.	PTB: para 180 and PTR: para 287 and RMD: Instr 13 paras 9 to 20 and ACB: para 232.
4.4.18	Balance wheels.	AEM and ACB: para 119.
4.4.19	Check engine compression and locate engine and fuel system malfunctions, using compression, vacuum and low-pressure gauges.	FLC: chap 8 and ENG: paras 174 & 175 and UTT: paras 77 to 79 and CTS: paras 83 & 111 and RMD: Instr 7 table 1.
4.4.20	Check the operations of and locate faults in clutch assemblies, steering systems, hydraulic brake systems and hydraulic portions of air-assisted- hydraulic brake systems.	ACB: paras 195 & 196 and UTT: paras 89, 95 & 99 and CTS: paras 96 & 99 and RMD: Instr 1 table 4, Instr 10 table 1 & Instr 11 table 1.

Group 3

4.5. In addition to the requirements for group 2, and to perform his duties satisfactorily, the group 3 tradesman must:

4.5.1	Be able to use and care for telescopic and small-hole gauges, protractors, surface plates, dial indicators, vernier calipers and height gauges.	MTO: pp 59 to 80, 98 to 103 & 147 to 160 and HMT: paras 73 & 81.
4.5.2	Know the purpose and use of abrasives used in his trade and be able to dress grinding wheels.	OMT: paras 42 & 45 and AEM.
4.5.3	Be able to prepare free-hand dimensional working sketches.	DFT: paras 162 to 169 & 183 to 190.
4.5.4	Be able to use oxyacetylene welding equipment for cutting and making emergency repairs for recover operations.	WTA: paras 36 to 44, 54 to 64, 66, 68 to 81, 83, 84, 87, 88 & 114 to 117.
4.5.5	Know the effects of heating, cooling and mechanical working of common metals and alloys.	WTA: paras 51 to 53 and RSP: no 2-5-4.
4.5.6	Be able to test, repair and adjust carburetors, engine governors and electric fuel pumps.	CAC: chaps 9, 12 & 13 and CGH: chaps 6 & 14 and EFP: chap 6 and DRE: chap 5 para 113e.
4.5.7	Be able to test, adjust, remove, repair and replace the following components of air brake systems and air operated devices:	
4.5.7.1	Compressors.	BWH: paras 14 to 50.
4.5.7.2	Governors.	BWH: paras 51 to 57.
4.5.7.3	Pedal, treadle and hand operated brake valves.	BWH: paras 58 to 64, 66 to 70 & 77 to 81.
4.5.7.4	Quick release valves.	BWH: paras 87 to 91.
4.5.7.5	Relay valves and relay emergency valves.	BWH: paras 92 to 106.
4.5.7.6	Brake chambers and roto chambers.	BWH: paras 107 to 126.
4.5.7.7	Slack adjusters and linkage.	BWH: paras 128 to 136.
4.5.7.8	Double and single check valves.	BWH: paras 137 to 154.
4.5.7.9	Air lines and connections.	BWH: paras 166 to 178.

4.5.7.10	Air reservoirs, air gauges, safety valves and air operated devices.	BWH: paras 179 to 213.
4.5.8	Be able to test, adjust, remove, repair and replace the following components of air-assisted-hydraulic brake systems and associated equipment:	
4.5.8.1	Compressors.	PBE: paras 29 to 87.
4.5.8.2	Governors.	PBE: paras 138 to 153 and CTS: para 246.
4.5.8.3	“Air-Paks”.	BRK: paras 22, 23, 35 to 38 & 162 to 182.
4.5.8.4	Air reservoirs and safety valves.	CTS: para 249.
4.5.8.5	Air horns and windshield wipers.	PTR: paras 291 & 295 to 297 and CTS: paras 185 & 295.
4.5.9	Be able to remove, repair, adjust and replace SMP front and rear axle assemblies.	PTR: paras 195 to 209 and PTB: paras 85 to 133 and RMD: Instr 4 & Instr 5.
4.5.10	Be able to remove, replace and adjust the 2½-ton SMP and armoured tracked carrier transmissions.	CTS: paras 201 to 205 and BOB: part 4 sec 6 and RSP: no 6-14-1 paras 61 to 64 and HTM: paras 29 to 31 & 54 to 154.
4.5.11	Know the service procedures and the location and function of the controls, instruments and auxiliary equipment on the armoured tracked carrier.	BOB: part 3 secs 1A, 2A, 3A & 5A.
4.5.12	Be able to test, adjust, remove, repair and replace the following components of the armoured tracked carrier:	
4.5.12.1	Engine and accessories.	BOB: part 4 sec 2.
4.5.12.2	Engine cooling, lubricating and fuel systems.	BOB: part 4 secs 3 to 5.
4.5.12.3	Final drive, suspension, track, brake and steering systems.	BOB: part 4 secs 7 to 10.
4.5.12.4	Hull, cupola, auxiliary equipment and electrical systems.	BOB: part 4 secs 11 to 13.
4.5.13	Be able to test, adjust, remove, repair and replace the following assemblies and components of 5-ton SMP vehicles:	

4.5.13.1	Engine and clutch assemblies and components.	CEC: chaps 3 to 5 and OOM: paras 117, 118 & 203.
4.5.13.2	Fuel, exhaust and cooling systems.	OOM: paras 119 to 140.
4.5.13.3	Ignition and electrical systems.	OOM: paras 141 to 194.
4.5.13.4	Steering, brake and compressed air systems.	OOM: paras 219 to 250 and RSG: paras 79 to 89.
4.5.13.5	Transmissions and transfer cases.	PTT: paras 70 to 112.
4.5.13.6	Axle assemblies and suspension systems.	PTT: paras 144 to 204.
4.5.13.7	Front winch assembly.	PTT: paras 307 to 324.
4.5.14	Be able to test, adjust, remove, repair and replace the following assemblies and components of the Triumph motorcycle:	
4.5.14.1	Engine, transmission and clutch.	THB: secs 1 to 3.
4.5.14.2	Steering, suspension, wheels and brakes.	THB: secs 4 & 5.
4.5.14.3	Electrical equipment.	THB: sec 7.
4.5.15	Know the soil characteristics which affect recovery operations and be able to operate and maintain the M62 wrecker, select and lay out equipment and recover vehicle casualties.	OOM: paras 12 to 53, 57 to 77, 256 to 263, 267, 268, 270a, 271a (2), 272 (1), 273a & 273b and REC: chap 2 paras 214 to 217 & 228 to 231, chaps 3 to 7, chap 8 paras 801 to 811, chap 9 paras 901 to 906, chap 10, chap 11 paras 1101 to 1109, chaps 12 & 14 & anxs A to F.
4.5.16	Know basic steering geometry and front-end alignment procedures.	ACB: paras 55 to 65 & 117 to 125 and AEM.
4.5.17	Know charging circuits, starting circuits and engine testing procedures and test equipment and be able to diagnose engine faults and carry out engine tune-ups.	ENG: chaps 11 & 12 and AEE: chaps 18 & 19 and AEM and ALE: chap 3 secs 6 & 7, chap 4 secs 5 & 6 & chap 6 secs 6 & and DRE: chap 3 secs & 9, chap 4 secs 9 to 11 & chap 6 secs 11 & 12.

4.5.18	Know the purpose of the controls on the Bendix electronic ignition analyser and be able to connect it up to a vehicle ignition system using the inductive pick-up and recognize the wave form of a properly operating ignition system.	BIA: form MG 757 sec 3 & form L 467 sec 1 paras 1-2 & 1-3 & sec 2 paras 2-3 to 2-8, 2-17 to 2-31, 2-39 to 2-44 & 2-79 to 2-82.
4.5.19	Be able to trouble-shoot and diagnose faults in vehicle power train, steering and braking systems.	ACB: paras 195, 196, 198, 210 & 212 and UTT: paras 89 to 99 and CTS: paras 90 to 101 and OOM: paras 89 to 101 and RMD: Instr 2 tables & 4, Instr 3 table 1, Instr 4 table 1, Instr 5 table 1, Instr 6 table 1, Instr 10 table 1 & Instr table 1.

5. Responsibility

5.1. The Vehicle Mechanic Wheeled Group 1 is responsible under direct supervision, and the group 2 tradesman under general supervision, for locating faults and making repairs and adjustments to ¼-ton, ¾-ton and 2½-ton SMP vehicles vehicles and certain repairs and adjustments to commercial type vehicles.

5.2. The group 3 tradesman is responsible, under minimum supervision, for more detailed fault finding and repairs to most wheeled vehicles, motorcycles and the armoured tracked carriers.

6. Working Conditions

6.1. Physical

6.1.1. His duties involve considerable effort when handling heavy tools and vehicle assemblies.

6.1.2. In the field, his duties are performed under cover or in the open. In static locations he normally works inside.

6.2. Stresses

6.2.1. Mental stress is normal.

6.3. Occupational Hazards

6.3.1. The normal hazards are cuts, bruises and abrasions and exposure to skin irritations from petroleum products.

6.3.2. When working on recovery, more serious injuries may occur.

7. Method of Qualification

7.1. Qualification for Group 1

7.1.1. To qualify as a Vehicle Mechanic Wheeled Group 1, the candidate must be qualified to drive J-ton, f-ton and 2i-ton SMP vehicles.

7.1.2. Qualification may then be obtained by passing a course authorized by Army Headquarters.

7.1.3. The scope of the course will include the requirements of paragraph 4.3 of this specification.

7.2. Qualification for Group 2

7.2.1. To qualify as a Vehicle Mechanic Wheeled Group 2, the candidate must be qualified as a Vehicle Mechanic Wheeled Group 1.

7.2.2. Qualification may then be obtained by passing a trade test authorized by Army Headquarters.

7.2.3. The scope of the trade test will include the requirements of paragraph 4.4 of this specification.

7.3. Qualification for Group 3

7.3.1. To qualify as a Vehicle Mechanic Wheeled Group 3, the candidate must:

7.3.1.1. Be qualified as a Vehicle Mechanic Wheeled Group 2; and

7.3.1.2. Be certified proficient by his commanding officer in the requirements of paragraphs 4.5.1 to 4.5.5 of this specification.

7.3.2. Qualification may then be obtained by passing a course authorized by Army Headquarters.

7.3.3. The scope of the course will include the requirements of paragraphs 4.5.6 to 4.5.19 of this specification.

8. Career Possibilities

8.1. Trade Progression

8.1.1. A Vehicle Mechanic Wheeled Group 3 may progress to Master Vehicle Technician Group 4.

9. Related Occupations

9.1. Navy - None

9.2. Air Force - Mobile Support Equipment Technician Group 3

9.3. Dictionary of Civilian Occupational Titles Code Number

Automotive Mechanic (auto ser.)	5-81.010
Motorcycle Repairman (auto ser.)	5-81.020
Truck Mechanic (auto, ser.)	5-81.030

10. Implementing Instructions

10.1. This new specification replaces that for Vehicle Mechanic Wheeled Groups 1, 2 and 3 dated 23 Feb 54. It is written in the new specification format to describe more fully the specific skills and knowledge required and to detail the training references.

10.2. The other major changes in this specification are:

10.2.1. The deletion of repairing diesel engines.

10.2.2. The deletion of preservation procedures.

10.2.3. The addition of the repair of the armoured tracked carrier to replace training no longer given on the Universal carrier.

10.2.4. The addition of emergency welding and cutting.

10.2.5. The change in the method of qualification for group 3 from the trade test to certification in one portion and a qualifying course in the other.

10.3. RCEME personnel now qualified as Vehicle Mechanics Wheeled are considered qualified in accordance with this new specification. RCASC personnel are the subject of a separate instruction from Army Headquarters.

10.4. Army Headquarters will arrange that group 3 tradesmen are given training on the armoured tracked carrier and the Bendix electronic ignition analyser as soon as practicable.

Effective Date: 1 Jul 63

Master Vehicle Technician
Group 4, 1963

Master Vehicle Technician Group 4

Army Trade Specification M.61

1. General Information

1.1. Classification

Full Title	Abbreviation	Code Number
Master Vehicle Technician	Mr Veh Techn	Group 4 7784

1.2. Selection Requirements

1.2.1. Candidates must be members of The Corps of Royal Canadian Electrical and Mechanical Engineers or be willing to, and acceptable for, transfer to that corps.

1.2.2. Minimum “M” score and educational level: 150 and Grade 10.

PULHEMS Profile

Battle	Support	Base
3333312	3333313	4334314

2. Summary

2.1. Makes complete diagnosis and performance analysis of and carries out repairs to wheeled vehicles, armoured fighting vehicles (AFVs), heavy mobile engineer equipment, compressors and similar engine driven equipments.

3. Duties and Tasks

3.1. Carries out both battery and magneto ignition trouble-shooting, using electronic ignition analysers.

3.2. Analyzes the performance of gasoline and diesel engines and their components, using dynamometers and other test equipment.

3.3. Carries out precision inspection and advanced repairs to vehicles and vehicle components.

3.4. Makes repairs and adjustments to diesel fuel injection systems and governors.

3.5. Diagnoses faults in and repairs hydramatic and heavy transmissions, transfer cases and two-speed axles.

3.6. Checks and corrects frame alignment, wheel balance and steering alignment.

3.7. Diagnoses faults in and repairs attachments to engineer equipment.

3.8. Services, diagnoses faults in and repairs vehicle servicing equipment.

3.9. Carries out “in and out inspections” on all equipments of his trade.

3.10. Devises methods of testing and repairing equipment for which there is no technical data.

3.11. Examines vehicle casualties to determine extent of repairs required and their cost.

3.12. Carries out complex recovery operations to wheeled vehicles and AFVs.

3.13. Determines the cause of equipment failures, recommends modifications and prepares working sketches.

3.14. Prepares spare parts scales for special equipment and for special repair programmes.

3.15. Uses and interprets various technical publications and drawings for information on procedures and for specific detail.

4. Training, Experience, Skills and Knowledge Required

4.1. The group 4 tradesman requires the skills and knowledge described in this specification. The degrees of skill and knowledge will be determined from the references listed. To qualify, he must reach the level shown but not any higher level.

4.2. Only the publications shown below will be used as reference material:

ACB - Automotive Chassis and Body by W. H. Crouse - 2nd Edition - 1959.

ARR - Applicable equipment manual.

ARR - Automotive expedients.

ARV - NATO stock no 7610-21-111-8034 (WO Code no 12234) - User Handbook for Tank, ARV, Centurion Mk 2 - 1958.

ATS - Applicable Trade Specification.

BCW - United States Technical Manual, TM 9-1767C - Body, Chassis and Winches for Tractor Truck M26 - Jan 1944.

BIA - NATO stock no 7610-21-102-2614 - Bendix Ignition Analyser.

BOB - Notes on Canadian Armoured Tracked Carrier (Bobcat) - Development Phase - Jul 1958 (Confidential).

BRK - United States Technical Manual, TM 9-8651 - Power Brake Systems (Bendix BK) - Jan 1956.

BWH - United States Technical Manual, TM 9-1827A - Power Brake Systems (Bendix Westinghouse) - Feb 1953.

CAC - United States Technical Manual, TM 9-1826A - Carburetors (Carter) - Dec 1952.

CAT - Serviceman’s Reference Book for Caterpillar Diesel Engines (4-1/4-inch bore 6-cylinders) - Form 30519.

CBL - NATO stock no 7610-21-102-1279 - Broomwade Spares and Maintenance Manual - Publication 115 - WR 280M - Rotary Compressor with Chrysler Petrol Engine.

CCC - Serviceman's Reference Book - Caterpillar Cable Controls - Form 10088-2.

CDE - Cummins Shop Manual - Unit Rebuilding - Diesel Engines - Bulletin 983358-A.

CEC - United States Technical Manual, TM 9-1837A - Engine and Clutch (Continental) - Apr 1952.

CGH - United States Technical Manual, TM 9-8647 - Carburetors and Governors - (Holley) - Aug 1958.

CHC - Serviceman's Reference Book - Caterpillar Hydraulic Controls and Equipment - Form 12914-2.

CSM - Cummins Shop Manual - PT Fuel Systems - Bulletin 983334-D.

CTH - WO Code no 1899 - Centurion Technical Handbook - May 1950.

CTS - NATO stock no 7610-21-102-2412 (TM 9-8024) - 2½-ton 6X6 Cargo Truck M135 - Oct 1955.

CUH - NATO stock no 7610-21-102-2048 (WO Code no 10538) - Centurion Users Handbook.

DRE - United States Technical Manual TM 9-8627 - Electrical Equipment - (Delco-Remy) - Jun 1953.

ECW - United States Technical Manual, TM 9-1804A - Engine and Clutch for ¼-ton 4X4 Utility Truck M38 - Jun 1951.

EEA - United States Technical Manual, TM 9-1767A - Engine and Accessories for Tractor Truck M-26 - Dec 1943.

EFP - United States Technical Manual, TM 9-1828A - Fuel Pumps - Dec 1952.

EME - Canadian Army Electrical and Mechanical Engineering Manual.

GMD - General Motors Diesel - Series 71 - Maintenance and Overhaul Manual - Form 6SE-102 - Sep 1955.

GME - United States Technical Manual, TM 9-8025-1 - GMC Model 302 Engine - May 1958.

HNH - Operation and Maintenance Instructions - Herman- Nelson Gasoline Engine Powered Portable Heaters - Form 3492.

HPH - Herman Nelson Portable Heater - Gasoline Burning Model - Form 3333.

HSD - High Speed Diesels by P. M. Heldt.

IDP - WO Code no 9512 - Instructor's Driving Pamphlet - Centurion - 1958.

IHB - Serviceman's Field Reference - International Harvester Co. - Form

ISS - 1012.

IHC - Service Manual - International Crawler Tractor - Form ISS-1014.

IHD - Service Manual - International Power Units - Form CHS-175.

IRH - Handbook of the Air Compressor - Trailer Type - Ingersol-Rand Model 105-A-1942.

LBT - NATO stock no 7610-21-102-2324 (TM 9-8222) - 25-ton 4-wheel low bed semi-trailer M172 - Dec 1955.

LOM - Thew-Lorain Operation Manual - The Thew Shovel Co. - Lorain Power Shovel - Class 1 and 2 series.

LUK - NATO stock no 7610-21-102-2020 - User Handbook for Lubricating Kit (SEV 1201) - Mar 1958.

MHW - Instruction Manual for Hyster D6N Towing Winch - Form 207H.

MMA - Maintenance Manual for Adams Motor Grader 550.

OMC - Operation and Maintenance - Cummins Diesel Engines - Bulletin no 983373-B.

OMI - Operation and maintenance Instruction, D6 Tractor - Form 12692-9.

OOM - NATO stock no 7610-21-102-1975 (TM 9-8028) - 5-ton 6X6 Cargo Truck - Jun 1955.

ORD - Canadian Army Manual of Ordnance Instructions.

PAV - United States Technical Manual, TM 9-8000 - Principles of Automotive Vehicles - Jan 1956.

PBE - United States Technical Manual, TM 9-8601 - Power Brake Equipment - Dec 1954.

POM - United States Technical Manual, TM 9-1767B - Power Train for Tractor Truck M26 - Dec 1943.

PTB - United States Technical Manual, TM 9-1804B - Power Train, Body and Frame - ¼-ton 4X4 Utility Truck M38 - Jul 1952.

PTR - United States Technical Manual, TM 9-1819AC - 2½-ton Power Train - Dec 1952.

PTT - United States Technical Manual, TM 9-1837B - Power Train - 5-ton 6X6 Cargo Truck - Sep 1952.

RBC - Serviceman's Reference Book - Caterpillar Diesel Engines - Form 30238-3.

REC - Canadian Army Manual of Training, CAMT 11-4 - Recovery - 1962.

RMD - Canadian Army EME Manual - Veh D114 - Repair Manual - Truck ¼-ton Dodge.

RSG - United States Technical Manual, TM 9-8615 - Steering Gears (Ross Gear and Tool Co.) - Jun 1953.

RSP - RCEME School Precis.

SCF - British EMER - Wheeled Vehicles V622 - Scout Car, Ferret - Technical Handbook - Aug 1957.

SRB - Serviceman's Reference Book - Caterpillar D6 Tractor - Form 30027-3.

TCC - Canadian Army EME Manual - Veh J282 - Tank Centurion Canadian.

THB - British EMER - Wheeled Vehicles B722 - Motorcycle 500cc - Triumph.

TSD - Workshop Manual for "B" Range Petrol Engines - TSD Publication 702.

TSM - Truck Shop Manual - Vol 1 - Chrysler Corporation of Canada - WM 4435.

TTT - United States Technical Manual, TM 9-767 - Tank Transporter Truck Trailer M25 - Feb 1944.

TTV - Operation and Maintenance Instruction - OM 872/55, 60-ton Tank Transporter by DVD - Jan 57.

UTT - United States Technical Manual, TM 9-8012 - ¼-ton 4X4 Utility Truck M38 - Jan 1956.

VCH - Vapor Clarkson - Vapor Spray Cleaners, Type 4942 (VCH 1 or VCH 2).

VSD - Vehicle Overhaul Specifications issued by DEME.

WCM - United States Technical Manual, TM 9-8029-3 - Wrecker Crane Rear Mounted - Medium Wrecker M62 - 1954.

4.3. In addition to being a group 3 tradesman in one of the vehicle mechanic trades and satisfying the other requirements of paragraph 7.1, the Master Vehicle Technician Group 4 must have the specific skills and knowledge described in the appropriate paragraphs hereunder.

4.4. If he is qualified as a Vehicle Mechanic Wheeled Group 3 he must:

4.4.1	Know the operating principles of diesel engines and fuel systems and the functions of their components.	PAV: paras 9, 74 to 76 & 80 to 82 and GMD: sec 15 pp 1 to 6.
4.4.2	Know the general layout and construction of AFVs.	CUH: pp 7 to 16, 19, 41 to 44, 56 & 76 to 79 and RSP: no 6-27-1 secs 1 & 2.
4.4.3	Know the operating principles and functions of AFV power train components.	TCC: Instr 4 and RSP: no 6-27-1 secs 11 & 13 to 15 and PAV: paras 186 to 188, 190 to 194, 199 to 201, 214, 215, 217, 218, 220 & 230.

4.4.4	Know the operating principles of AFV suspension and track systems and the functions of their components.	TCC: Instr 7 and RSP: no 6-27-1 sec 16.
4.4.5	Know the operating principles of AFV steering and braking systems and the functions of their components.	TCC: Instr 5 and RSP: no 6-27-1 sec 15.
4.4.6	Know the safety precautions for operating Centurion and M4A2 tanks and be able to start and stop them and move them safely within an enclosed area.	IDP and RSP: no 6-27-1 secs 4 & 10.
4.4.7	Be able to carry out the following tests, adjustments and repairs on the Centurion and M4A2 AFVs (excluding Centurion main engines):	
4.4.7.1	Remove, clean, check and replace cylinder heads, valves, valve guides, valve lifters and camshafts and grind, reseat and adjust valves.	TCC: Instr 2 paras 19, 20, 31 & 32 and CTH: pp 645, 648, 649, 652 & 661 to 663 and GMD: secs 9, 11 & 15 pp 18 to 20.
4.4.7.2	Remove, clean, check and replace pistons, piston rings, piston pins, connecting rods and oil pans and clean and prepare the cylinder block for inspection.	TCC: Instr 2 paras 25 to 28 and CTH: pp 646, 649, 651, 661 & 662 and GMD: sec 6.
4.4.7.3	Remove and replace starting motors, electric fuel pumps, carburetors, intake manifolds, fuel tanks and fuel level sending units.	CTH: pp 327, 328, 334, 335 & 553 to 556 and RSP: no 6-27-1 sec 8 and GMD: sec 18 pp 7 & 8.
4.4.7.4	Remove, repair and replace oil pumps, filters, mechanical fuel pumps and fuel lines and fittings.	CTH: pp 273 to 275, 443 & 477 to 480 and GMD: sec 12 & sec 15 pp 21 to 30 and GME: paras 49, 87 to 90 & 105 to 135 and RMD: Instr 1 paras 250 to 266 & 369 to 377.
4.4.7.5	Remove, repair and replace components of the cooling system (excluding radiator repairs).	CTH: pp 280, 288 to 294 & 333 and RSP: no 6- 27-1 sec 7.
4.4.7.6	Remove and install auxiliary engines.	CTH: pp 636 to 639 and CUH: pp 45 to 51 and RSP: no 6-27-1 sec 10.
4.4.7.7	Pressure test cooling systems.	EME: Veh J284 Instr 1.

4.4.7.8	Remove, repair, replace and adjust steering and braking systems.	CTH: pp 301 to 308 and RSP: no 6-27-1 sec 15.
4.4.7.9	Remove, repair, replace and adjust track and suspension components.	CTH: pp 313 to 321 & 612 to 626 and TCC: Instr 7 and RSP: no 6- 27-1 sec 16.
4.4.7.10	Remove and replace bilge pumps and flame detector switch harness assemblies.	CTH: pp 353 to 356.
4.4.7.11	Adjust the M4A2 tank engine governor and fuel pump injector and the Centurion auxiliary engine governor.	TCC: Instr 2 paras 77 to 82 and GMD: sec 16 pp 1 to 3 & sec 19 pp 13 to 20.
4.4.8	Be able to test, repair and adjust carburetors and engine governors used on AFVs.	CTH: pp 493 to 498 & 657 to 660 and GMD: sec 16.
4.4.9	On Centurion tanks, be able to:	
4.4.9.1	Remove, time, test, install and adjust the main engine.	CTH: pp 433 to 440 & 524 to 537 and TCC: Instr 1.
4.4.9.2	Remove and replace gearboxes, clutches and final drives and adjust clutches.	CTH: pp 543 to 546, 560 & 596 to 598 and RSP: no 6-16-6 part 2 and TCC: Instrs 1 & 2.
4.4.9.3	Test, adjust, remove and replace faulty components of battery and magneto ignition systems and engine electrical accessories.	CTH: pp 276 to 279 & 334 to 348 and TCC: Instrs 4 & 5.
4.4.10	On M4A2 tanks, be able to:	
4.4.10.1	Remove, repair, install and adjust the main engine and clutch.	RSP: no 6-27-1 secs 11 & 12 and GMD: secs 1 to 16 & 19.
4.4.10.2	Remove and replace transfer cases, drive shafts, final drives, transmissions and controlled differentials.	RSP: no 6-27-1 secs 13 to 15.
4.4.10.3	Remove, repair and replace component parts of fuel and lubricating systems.	RSP: no 6-27-1 secs 6 & 8 and GMD: secs 12, 14 & 15.
4.4.10.4	Remove and replace component parts of cooling and electrical systems.	RSP: no 6-27-1 secs 7 & 9 and GMD: sec 13.
4.4.10.5	Synchronize the M4A2 engines.	RSP: no 6-27-1 pp 53 & 54.
4.4.11	On Ferret scout cars, be able to:	

4.4.11.1	Remove, repair, replace, test and adjust the engine (excluding crankshaft).	RSD: chap 5 secs 1, 3 to 7, 9 & 14 and SCF: paras 40 to 50.
4.4.11.2	Remove, repair and replace component parts of fuel, lubricating, cooling and ignition systems.	TSD: chap 1 & chap 5 secs 17B, 18B & 19 to 22 and EME: Veh N023 Instrs 2 & 4 & Veh N024 Instr 3 and SCF: para 34.
4.4.11.3	Remove, repair and replace component parts of fluid flywheels, transmissions, transfer cases, propeller shafts, bevel boxes and wheel hubs.	EME: Veh N023 Instr 6 & Veh N024 Instr 1 sec 2 & Instrs 4 & 5 and SCF: paras 39 to 157.
4.4.11.4	Remove, repair and replace component parts of steering, braking and suspension systems and road wheels.	EME: Veh N023 Instrs 7 & 8 & Veh N024 Instrs 6, 7 & 9 and SCF: paras 158 to 231.
4.4.11.5	Test, remove and replace components of electrical accessory equipment, charging systems and starting systems.	SCF: paras 232 to 306, 325 to 428 & 447 to 454 and TSD: chap 5 secs 23B to 23D & 24E.
4.4.12	Know the construction and operating principles of the International Harvester, Caterpillar and Cummins diesel engines and be able to repair, test and adjust their fuel systems.	CAT: pp 1 to 115 and CSM and CDE: secs 1 to 12 and IHB and IHD: paras 272 to 277 and OMC: secs 1, 2 & 5 and RBC: pp 86 to 142 and PAV: paras 9c, 9d, 75, 76 & 85 and HSD: pp 167, 185, 186 & 409 to 420 & chap 17 and OMI: pp 60, 61, 64 to 67 & 77.
4.4.13	Be able to operate, test, adjust and repair reciprocating type air compressors.	IRH: part 1.
4.4.14	Be able to operate, test, adjust and repair rotary type air compressors.	CBL: pp 3, 4 & 33 to 43 and RSP: no 6-30-16.
4.4.15	Know the operating principles of motorized graders and be able to test, adjust and repair their:	
4.4.15.1	Engines.	MMA: sec 1.
4.4.15.2	Transmissions.	MMA: sec 2.
4.4.15.3	Tandems.	MMA: sec 3.
4.4.15.4	Brakes.	MMA: sec 4.
4.4.15.5	Power controls.	MMA: sec 5.

4.4.15.6	Blade controls.	MMA: sec 6.
4.4.15.7	Circle and circle reverses.	MMA: secs 7 & 12.
4.4.15.8	Front axle and front lean mechanisms.	MMA: secs 8 & 9.
4.4.15.9	Steering.	MMA: sec 10 pp 5, 6 & 8 and RSG: paras 79 to 89.
4.4.15.10	Wheels.	MMA: sec 14.
4.4.15.11	Scarifier mechanisms.	MMA: sec 11.
4.4.16	Know the operating principles of crawler type tractors and be able to test, adjust and repair their:	
4.4.16.1	Flywheel clutches.	SRB: pp 71 to 81 and IHC: paras 30 to 42.
4.4.16.2	Transmissions.	SRB: pp 81 to 108 and IHC: paras 464 to 471.
4.4.16.3	Bevel drives.	SRB: pp 109 to 118 and IHC: paras 472 to 478.
4.4.16.4	Steering brakes and clutches.	SRB: pp 120 to 136 and IHC: paras 345 to 400.
4.4.16.5	Final drives.	SRB: pp 137 to 151 and IHC: paras 278 to 344.
4.4.16.6	Track frames and tracks.	SRB: pp 153 to 187 and IHC: paras 401 to 463.
4.4.17	Know the operating principles of crane shovels and be able to test, adjust and repair their:	
4.4.17.1	Boom hoists and clutch shafts.	LOM: pp 99 to 106.
4.4.17.2	Swing mechanisms.	LOM: pp 107 to 110.
4.4.17.3	Hoist drums.	LOM: pp 110A to 111.
4.4.17.4	Power take-offs.	LOM: pp 111 to 117.
4.4.17.5	Turntable thrust rollers.	LOM: p 117.
4.4.17.6	Crawler mechanisms.	LOM: pp 118 to 123.
4.4.17.7	Attachments.	LOM: pp 124 to 129.
4.4.18	Know the operating principles of and be able to operate and maintain the Centurion ARV.	ARV: paras 1 to 217 & 318 to 335.

4.4.19	Be able to trouble-shoot and diagnose faults in and tune-up AFV gasoline and diesel engines.	TSD: chap 4 and ARV: pp 37 & 38 and GMD: sec 19 and RSP: no 6- 16-6 part 1.
4.4.20	Be able to trouble-shoot diagnose faults in the selector type gear box.	EME: Veh N023 Instr 6 & Veh N024 Instr 4 p 27.

4.5. If he is qualified as a Vehicle Mechanic Tracked Group 3 he must:

4.5.1	Know the operating principles and functions of automotive chassis, springs and shock absorbers.	ACB: paras 27 to 31, 36 to 46, 51 & 52 and PAV: paras 233 to 240 & 309 to 312.
4.5.2	Know the operating principles of mechanical, hydraulic and air-hydraulic brake systems and the functions of their components.	ACB: paras 33 & 174 to 184 and BRK: paras 22, 23 & 162 to 165 and PAV: paras 278 to 288, 292, 296 to 299 & 302.
4.5.3	Know the operating principles of the automotive steering system and the functions of its components.	ACB: paras 32 & 55 to 66 and PAV: paras 259 to 267 & 272 to 277.
4.5.4	Know the common types of tires and wheels used on service vehicles and the causes of irregular tire wear and be able to mount and dismount tires.	EME: Veh A761 secs 1 to 5 & 7 and ACB: para 85.
4.5.5	Be able to carry out the following tests, adjustments and repairs on ¼-ton, ¾-ton and 2½-ton SMP vehicles:	
4.5.5.1	.1 Remove, clean, check and replace cylinder heads, manifolds, valves, valve guides, valve lifters and camshafts and grind, reseat and adjust valves.	ECW: paras 32, 36 to 39, 42, 43, 54 to 63, 75 to 80, 90 & 91 and GME: paras 42 to 47, 102 to 104, 110, 124 & 137 to 145 and RMD: Instr 1 paras 117 to 126, 145 to 158, 165 to 167, 241 to 249, 292 to 319 & 336 to 345.
4.5.5.2	.2 Remove, clean, check and replace pistons, piston pins, piston rings and connecting rods, and clean and prepare the cylinder block for inspection.	ECW: paras 40, 48 to 53 & 84 and GME: paras 51, 52, 106, 107, 117 & 131 to 133 and RMD: Instr 1 paras 212 to 240.

4.5.5.3	Remove, clean and replace oil pans, oil filters, oil pumps, by-pass valves and vents and repair oil pumps.	ECW: paras 28, 38, 43, 64 to 67, 89, 92 & 135 to 141 and GME: paras 29, 49, 50, 87 to 90, 93 to 96, 105, 134 & 135 and RMD: Instr 1 paras 104 to 116, 127 to 130, 250 to 266, 330 to 335, 351 to 360 & 369 to 377.
4.5.5.4	Remove, clean, repair, adjust and replace standard clutch assemblies.	ECW: paras 34, 86 & 127 to 134 and RMD: Instr 1 paras 74 to 81 & 455 to 490.
4.5.5.5	Remove and replace engine assemblies.	UTT: paras 116 to 119 and CTS: paras 116 to 120 and RMD: Instr 1 paras 24 to 57 & 417 to 454.
4.5.5.6	Remove and replace fuel system components and test and repair mechanical fuel pumps and fuel lines.	UTT: paras 127 to 136 and CTS: paras 125 to 128 & 131 to 133 and RMD: Instr 7 paras 1 to 6, 130 to 198, 218 to 221 & 250 to 252.
4.5.5.7	Remove and replace exhaust system components.	UTT: paras 137 to 139 and CTS: paras 137 to 140 and RMD: Instr 7 paras 253, 273 to 281 & 305 to 326.
4.5.5.8	Remove, test, repair and replace cooling system components (excluding radiator repair).	UTT: paras 120 to 126 and CTS: paras 141 to 149 and RMD: Instr 1 paras 267 to 281 & Instr 9 and GME: paras 83 to 86, 91 & 92.
4.5.5.9	Remove and replace electrical instruments, gauges, sending units, switches, fuses, circuit breakers and wiring.	UTT: paras 172 to 189 and CTS: paras 171 to 186 and RMD: Instr 8 paras 507 to 703.
4.5.5.10	Remove, repair and replace standard transmissions, transfer cases, universal joints, drive shafts, axle shafts and axle assemblies (excluding repair of differential assemblies).	UTT: paras 197 to 207 and PTB: paras 48 to 95, 100, 101 & 109 to 119 and CTS: paras 210 & 215 to 233 and PTR: paras 81 to 120 & 153 to 225 and RMD: Instr 2 paras 1 to 109, Instr 3, Instr 4, Instr 5 paras 1 to 22 & 122 to 153 & Instr 6.

4.5.5.11	Remove, repair, replace and adjust steering system components.	UTT: paras 232 to 239 and CTS: paras 216 & 267 to 272 and RMD: Instr 11.
4.5.5.12	Remove, repair, replace and adjust mechanical and hydraulic brake systems and mechanical and hydraulic components of air-assisted hydraulic brake systems.	UTT: paras 228 & 240 to 247 and CTS: paras 234 to 242, 244, 245 & 253 to 256 and RMD: Instr 10.
4.5.5.13	Remove, repair and replace front and rear suspension units and shock absorbers.	UTT: paras 248 to 253 and CTS: paras 273 to 282 and PTR: paras 267 to 283 and RMD: Instr 13 paras 64 to 141 and PTB: paras 138 & 139.
4.5.5.14	Check vehicle frames for alignment.	PTB: para 180 and PTR: para 287 and RMD: Instr 13 paras 9 to 20 and ACB: para 232.
4.5.5.15	Check the operation of and locate faults in clutch assemblies, steering systems, hydraulic brake systems and hydraulic portions of air-assisted-hydraulic brake systems.	UTT: paras 89, 95 & 99 and CTS: paras 96 & 99 and RMD: Instr 1 table 4, Instr 10 table 1 & Instr 11 table 1 and ACB: paras 195 & 196.
4.5.6.16	Be able to test, repair and adjust carburetors, engine governors and electric fuel pumps.	CAC: chaps 9, 12 & 13 and CGH: chaps 6 & 14 and EFP: chap 6 and DRE: chap 5 para 113e.
4.5.7	Be able to test, adjust, remove, repair and replace the following components of air brake systems and air operated devices:	
4.5.7.1	Compressors.	BWH: paras 14 to 50.
4.5.7.2	Governors.	BWH: paras 51 to 57.
4.5.7.3	Pedal, treadle and hand operated brake valves.	BWH: paras 58 to 64, 66 to 70 & 77 to 81.
4.5.7.4	Quick release valves.	BWH: paras 87 to 91.
4.5.7.5	Relay valves and relay emergency valves.	BWH: paras 92 to 106.
4.5.7.6	Brake chambers and roto chambers.	BWH: paras 107 to 126.
4.5.7.7	Slack adjusters and linkage.	BWH: paras 128 to 136.
4.5.7.8	Double and single check valves.	BWH: paras 137 to 154.

4.5.7.9	Air lines and connections.	BWH: paras 166 to 178.
4.5.7.10	Air reservoirs, air gauges, safety valves and air operated devices.	BWH: paras 179 to 213.
4.5.8	Be able to test, adjust, remove, repair and replace the following components of air-assisted-hydraulic brake systems and associated equipment:	
4.5.8.1	Compressors.	PBE: paras 29 to 87.
4.5.8.2	Governors.	PBE: paras 138 to 153 and CTS: para 246.
4.5.8.3	“Air-Paks”	BRK: paras 22, 23, 35 to 38 & 162 to 182.
4.5.8.4	Air reservoirs and safety valves.	CTS: para 249.
4.5.8.5	Air horns and windshield wipers.	PTR: paras 291 & 295 to 297 and CTS: paras 185 to 295.
4.5.9	Be able to remove, repair, adjust and replace SMP front and rear axle assemblies.	PTR: paras 195 to 209 and PTB: paras 85 to 133 and RMD: Instr 4 & Instr 5.
4.5.10	Be able to remove, replace and adjust the 2½-ton SMP and armoured tracked carrier transmissions.	CTS: paras 201 to 205 and BOB: part 4 sec 6 and RSP: no 6-14-1 paras 61 to 64 and HTM: paras 29 to 31 & 54 to 154.
4.5.11	Know the service procedures and the location and functions of the controls, instruments and auxiliary equipment on the armoured tracked carrier.	BOB: part 3 secs 1A, 2A, 3A & 5A.
4.5.12	Be able to test, adjust, remove, repair and replace the following components of the armoured tracked carrier:	
4.5.12.1	Engine and accessories.	BOB: part 4 sec 2.
4.5.12.2	Engine cooling, lubricating and fuel systems.	BOB: part 4 secs 3 to 5.
4.5.12.3	Final drive, suspension, track, brake and steering systems.	BOB: part 4 secs 7 to 10.
4.5.12.4	Hull, cupola, auxiliary equipment and electrical systems.	BOB: part 4 secs 11 to 13.

4.5.13	Be able to test, adjust, remove, repair and replace the following assemblies and components of 5-ton SMP vehicles:	
4.5.13.1	Engine and clutch assemblies and components.	CEC: chaps 3 to 5 and OOM: paras 117, 118 & 203.
4.5.13.2	Fuel, exhaust and cooling systems.	OOM: paras 119 to 140.
4.5.13.3	Ignition and electrical systems.	OOM: paras 141 to 194.
4.5.13.4	Steering, brake and compressed air systems.	OOM: paras 219 to 250 and RSG: paras 79 to 89.
4.5.13.5	Transmissions and transfer cases.	PTT: paras 70 to 112.
4.5.13.6	Axle assemblies and suspension systems.	PTT: paras 144 to 204.
4.5.13.7	Front winch assembly.	PTT: paras 307 to 324.
4.5.14	Be able to test, adjust, remove, repair and replace the following assemblies and components of the Triumph motorcycle:	
4.5.14.1	Engine, transmission and clutch.	THB: secs 1 to 3.
4.5.14.2	Steering, suspension, wheels and brakes.	THB: secs 4 & 5.
4.5.14.3	Electrical equipment.	THB: sec 7.
4.5.15	Know basic steering geometry and front-end alignment procedures.	ACB: paras 55 to 65 & 117 and AEM.
4.5.16	Be able to trouble-shoot and diagnose faults in vehicle power train, steering and braking systems.	ACB: paras 195, 196, 198, 210 & 212 and UTT: paras 89 to 99 and CTS: paras 90 to 101 and OOM: paras 89 to 101 and RMD: Instr 2 tables & 4, Instr 3 table 1, Instr 4 table 1, Instr 5 table 1, Instr 6 table 1, Instr 10 table 1 & Instr table 1.

4.6. In either case he must also:

4.6.1	Be able to test, adjust and repair the following components the wrecker crane and rear winch of the medium wrecker M62:	WCM: paras 49 to 72.
4.6.1.1	Lift cylinder.	WCM: paras 12 to 15 & 77 to 79.
4.6.1.2	Swivel valve.	WCM: paras 16 to 18 & 80 to 82.
4.6.1.3	Swing motors.	WCM: paras 19 to 21 & 83 to 87.
4.6.1.4	Control valve bank.	WCM: paras 22 to 24 & 88 to 90.
4.6.1.5	Hydraulic motor and pump.	WCM: paras 25 to 30 & 91 to 96.
4.6.1.6	Hoist drum, worm and drive gear set.	WCM: paras 31 to 33 & 97 to 100.
4.6.1.7	Base plate and pivot post.	WCM: paras 34 to 36 & 101 to 104.
4.6.1.8	Shipper and boom.	WCM: paras 37 to 39 & 105 to 107.
4.6.1.9	Rear mounted winch.	WCM: paras 43 to 45 & 116 to 126.
4.6.1.10	Power take-off.	WCM: paras 127 to 131.
4.6.1.11	Power divider.	WCM: paras 132 to 135.
4.6.1.12	Drive line.	WCM: paras 136 to 141.
4.6.2	Be able to test, adjust, remove, repair and replace the following components of the truck- tractor M26A1 and trailer M25:	
4.6.2.1	Engines, clutches and fuel, lubricating and cooling systems.	EE A: paras 3 to 114 and TTT: paras 64 to 82.
4.6.2.2	Ignition and electrical systems.	TTT: paras 102 to 128.
4.6.2.3	Steering and braking systems.	TTT: paras 152 to 171, 181 to 189 & 222 and RSG: para 31 and BRK.

4.6.2.4	Transmissions, transfer cases, differentials and final drives.	POM: paras 2 to 84 and TTT: paras 129 to 180.
4.6.2.5	Auxiliary equipment.	BCW: paras 41 to 70 & 74 to 81.
4.6.2.6	Trailers.	TTT: paras 218 to 256 and TTV.
4.6.3	Be able to test, adjust, remove, repair and replace the following components of the tractor-truck M52 and the low bed semitrailer M172:	
4.6.3.1	Fifth wheel assembly.	PTT: paras 292 to 306.
4.6.3.2	Trailer chassis, brakes and suspension.	LBT: paras 96 to 113.
4.6.4	Be able to test, adjust and repair components and governors of diesel engine fuel systems.	IHBand CSM and CAT: pp 35 to 55 and OMI: pp 27 to 31, 36, 37, 43 & 59 to 68.
4.6.5	Be able to locate faults in, repair and adjust hydraulic and cable power control units.	CHC: pp 6 to 11, 59 to 76 & 117 to 126 and CCC: pp 4 to 8 & 38 to 55 and MHW: pp 2, 8, 9, 11 to 13 & 48.
4.6.6	Be able to test, adjust, remove, repair and replace vehicle components to effect complete frame, wheel and steering alignment.	AEM.
4.6.7	Be able to service, test, adjust, remove and replace components of the following vehicle workshop equipment:	
4.6.7.1	Power lubrication equipment	LUK: paras 2 to 10 & secs 1 to 4.
4.6.7.2	Steam cleaning equipment.	VCH.
4.6.7.3	Vehicle hoists.	AEM.
4.6.7.4	Engine dynamometers.	RSP: no 6-2-6.
4.6.7.5	Portable ground heaters.	HNH: pp 2 to 7 and HPH: p 1.
4.6.7.6	Wheel balancing equipment.	AEM.

4.6.8	Be able to test, adjust, disassemble, repair and reassemble two-speed rear axles and to diagnose and correct excessive drive line noises.	TSM: pp 3-41 to 3-49, 3-56 to 3-72 & 3-93 to 3-99 and RSP: no 6-9- 2.
4.6.9	Be able to test, adjust, disassemble, repair and reassemble components of the series 71 GMC diesel engine blower.	GMD: sec 14.
4.6.10	Be able to test and diagnose all faults on and repair hydramatic and armoured tracked carrier automatic transmissions.	RSP: no 6-14-1 and BOB.
4.6.11	Be able to replace wet and dry cylinder sleeves, crankshafts, main bearings and seals.	GMD: secs 3 & 5 and EME: Veh X264/4 Instr 2 and CAT: pp 77 to 90 and AEM.
4.6.12	Be able to make precision inspection of vehicle components.	VSD: nos 2-2-5-9 & 2- 2-5-10 and GME: paras 15 to 62 & 118 to 167.
4.6.13	Be able to carry out both battery and high tension magneto ignition trouble-shooting procedure using the Bendix electronic ignition analyser.	BIA: form MG 757 secs 1 to 3 & form L467.
4.6.14	Be able to carry out advanced vehicle trouble-shooting and fault finding procedures using dynamometers, exhaust gas analysers, diesel engine compression testers, diesel fuel system test equipment, generator regulator testers, power timing lights, tachometers, ignition system testers and multimeters.	AEM.
4.6.15	Have a basic knowledge of the capabilities and limitations of Body Repairmen, Welders, Machinist Fitters and Electrical Mechanics insofar as they affect vehicle repair procedures.	ATS.
4.6.16	Know the procedures for heat treating and case hardening.	RSP: no 2-5-2.

4.6.17	Be able to devise emergency repairs to vehicles and associated equipment, repair expedients when spare parts and technical data are not available and expedients to effect emergency modifications.	ARR: secs 1 & 3.
4.6.18	Be able to adapt and install special attachments on equipments for which they were not specifically designed.	ARR: secs 1 & 3.
4.6.19	Be able to devise recovery expedients and carry out complex recovery operations.	ARR: sec 2 and REC.
4.6.20	Have a general knowledge of the following Ordnance and EME Manual instructions insofar as they affect vehicle repair and spare parts control:	
4.6.20.1	Accountable parts.	ORD: 3-309-7.
4.6.20.2	Defective parts on equipment failure reports.	ORD: 3-310-2.
4.6.20.3	Classification and accounting for unsorted and condemned spare parts for RCOC.	EME: Man H110 and ORD: 3-412-3.
4.6.20.4	Accounting for spare parts and expendable stores in RCEME workshops.	EME: Man J171 and ORD: 7-281.
4.6.20.5	Accounting for spare parts in units other than RCEME workshops.	ORD: 7-282-5.
4.6.20.6	RCEME advance workshop detachments and servicing sections.	ORD: 7-281 & 7-284.
4.6.20.7	Unserviceable engine assemblies component parts.	ORD: 7-285.
4.6.20.8	Information to accompany demands.	ORD: 7-217-54 & 7-217- 55.
4.6.21	Be able to interpret permissive repair schedules and standard repair times for SMP vehicles.	EME: Veh A006 & Gen H300.

4.6.22	Be able to determine repair expenditure limits for vehicles and engineer equipment.	EME: Veh A114 Instrs 1 to 3 & Engr Eqpt A114 Instrs 1 & 2.
4.6.23	Be able to interpret instructions governing lubrication and servicing of vehicles.	EME: Veh A123 Instr 1, Veh A124, Veh A153 Instrs 1 & 9, Veh A453 Instr 1 & Veh A563.
4.6.24	Be able to interpret and carry out instructions for preservation, storage and shipment of vehicles and associated equipment.	EME: Veh A353 Instrs 1 & 2, Veh A354 Instrs 1 & 9 & Man H752 and STC: anx 4H.
4.6.25	Know the procedure for marking equipment repaired in RCEME workshops.	EME: Veh A410.
4.6.26	Be able to provide data for equipment failure reports, provisional condemnation certificates and abnormal condition reports.	EME: Man H550, Man H551, Man H601 & Man H651.
4.6.27	Be able to carry out vehicle modifications and complete records of modifications and semi-annual summaries of modifications.	EME: Man H501.
4.6.28	Be able to carry out periodic inspections on wheeled and tracked vehicles, materials handling equipment and engineer equipment, to assign applicable maintenance gradings and condition classifications and to determine quality of repairs done.	EME: Man H101, Engr Eqpt A103 Instr 1, Veh A053 Instr 2 & Veh A103 Instr 1.
4.6.29	Be able to estimate parts and labour required to effect repairs to unserviceable vehicles and damaged vehicles.	EME: Veh A006 and applicable Ordnance Parts Price Lists.
4.6.30	Be able to interpret parts lists, manufacturers bulletins, maintenance manuals, operators manuals and technical manuals affecting vehicle repair.	AEM.

4.6.31	Have a general knowledge of RCEME control and accounting procedures affecting vehicle repairs.	EME: Man K010.
4.6.32	Know the type of civilian contracts used to obtain RCEME services and have a general knowledge of the procedures involved.	EME: Man L101, Man L102, Man L103, Man L104 & Man L105.
4.6.33	Be able to initiate spare parts usage returns and recommend adjustment of stock levels.	EME: Man S011 & Man S012.
4.6.34	Be able to provide technical advice for use in preparation of spare parts scales for special equipment and for special vehicle and vehicle component	EME: Gen S010 & Gen S020.

5. Responsibility

5.1. The Master Vehicle Technician Group 4 is responsible under minimum supervision, for making all repairs to Cl and IC engine driven wheeled and tracked vehicles and heavy mobile engineer equipment. He is also responsible for complete fault diagnosis, performance analysis, adjustments, and final inspections.

6. Working Conditions

6.1. Physical

6.1.1. His duties involve considerable effort when handling heavy tools and pieces of equipment.

6.1.2. In the field his duties are performed under cover or in the open. In static locations he normally works inside.

6.2. Stresses

6.2.1. Mental stress is normal.

6.3. Occupational Hazards

6.3.1. The normal hazards are cuts, bruises and abrasions, and exposure to skin irritations from handling petroleum products.

7. Qualification for Group 4

7.1. To qualify as a Master Vehicle Technician Group 4, the candidate must:

7.1.1. Be qualified either as a Vehicle Mechanic Wheeled Group 3 or as a Vehicle Mechanic Tracked Group 3.

7.1.2. Have passed a pre-group 4 assessment in his basic trade.

7.2. Qualification may then be obtained as follows:

7.2.1. If his basic trade is Vehicle Mechanic Wheeled he must pass a course, authorized by Army Headquarters, the scope of which will include the requirements of paragraphs 4.4 and 4.6 of this specification.

7.2.2. If his basic trade is Vehicle Mechanic Tracked he must pass a course, authorized by Army Headquarters, the scope of which will include the requirements of paragraphs 4.5 and 4.6 of this specification.

8. Career Possibilities

8.1. Trade Progression

8.1.1. This trade does not progress to any other trade.

9. Related Occupations

9.1. Navy - None

9.2. Air Force - Mobile Support Equipment Technician Group 4

9.3.

Dictionary of Civilian Occupational Titles	Code Number
Automobile Mechanic Chief (auto ser.)	5-81.010
Automotive Department Foreman (tank ind.)	5-92.433
Garage Foreman (auto, ser.)	5-97.110

10. Implementing Instructions

10.1. This new specification replaces that for Vehicle Artificer Group 4 dated 23 Feb 54 (renamed Master Vehicle Technician Group 4 in AL 35).

10.2. The major changes in this specification are:

10.2.1. The deletion of the management and supervisory functions - and therefore the deletion of the NCO prerequisite to qualification.

10.2.2. The deletion of the requirement to do machining and welding, brazing and blacksmithing.

10.2.3. The deletion of voice procedure.

10.2.4. The addition of repairs to the armoured tracked carrier.

10.2.5. The addition of preservation storage and shipping procedures.

10.2.6. The addition of the inspection, repair and adjustment of materials handling equipment and a variety of mobile engineer equipment and shop tools and equipment.

10.2.7. The change in the method of qualification from the requirement for dual qualification plus a group 4 course to a requirement for group 3 qualification in one trade and passing a course. The first part of the course teaches the essentials of the other trade and is taught separately while the last part is common to all candidates.

10.3. Notwithstanding the changes described above, personnel now qualified as

Vehicle Artificers or as Master Vehicle Technicians are considered qualified in accordance with this new specification. Those now drawing group pay as Vehicle Artificers will be remustered immediately to this new trade.

Effective Date: 1 Jul 63